DEOGY DEPARTMENT

ONSTRUCTION PUBLIC LIB JUN 1 1 1929

A MONTHLY PICTORIAL OF F

General Construct



Construction Methods, June, 1929, Vol. 11, No. 6. Published Monthly, McGraw-Hill Publishing Company, Inc., Tenth Ave. at Thirty-sixth St., New York, N. V. Two years for \$1; per copy, 5 cents. Entered as second-class matter, October, 1926 issue. Vol. 8, No. 10, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

LEGICALOGY DEPT

June, 1929-CONSTRUCTION METHODS



Road Show at Atlantic City

TLANTIC CITY, N. J. will be the scene of the next Road Show, to be held January 11-18, 1930. The move from Cleveland, where the last two annual exhibits of highway equipment and materials were held, was decided upon by the American Road Builders' Association at its annual business session held in Washington last month. For a number of years, the Middle West-Chicago and Cleveland-has been the scene of the Road Show. Next year's move to the East is in line with the announced policy of the association's Board of Directors to hold the convention and show in different parts of the country from year to year. The 1930 convention and equipment exhibit will be staged in the huge new Convention Hall at the New Jersey seaside resort, described in Construction Methods last month.

Steel Floors

Of interest to constructors is the recent announcement of Lee H. Miller, chief engineer of the American Institute of Steel Construction, of an investigation of a new type of steel plate floor construction known as the "battleship deck" floor. Advantages claimed for the steel plate floor are that it will give greater strength and stability to buildings, reduce loads on columns and. therefore, be especially valuable in skyscraper construction. In the development of the new floor welding will play an important part. The proposed floor construction, it is claimed, will weigh from 20 to 60 lb. less per square foot than existing types.

000

Borings Prove Valuable

The practical value of commercial borings in connection with the design and construction of large bridges is made clear in a case cited by C. H. Kirch, bridge engineer of the Wisconsin State Highway Department. A survey made with sounding rods

some time ago indicated the presence of solid rock at a maximum depth of 40 ft. below water. Core borings, recently completed, told an entirely different story. The "solid rock" in-

Water-Works Articles This Month

In this issue of Construction Methods, appearing before the annual convention at Toronto, June 24-28, of the American Water-Works Association, special emphasis is given to water-works construction problems and their solution. To the reader are offered pictures and text on a variety of water-works subjects: Pipe lines of steel, concrete and cast iron; dams; reservoirs; pumping stations and other construction projects. To the development of the American municipality the water-works constructor contributes an essential service.

dicated by the soundings actually turned out to be the top of a layer of red clay. The core borings fixed the elevation of solid rock at from 65 to 80 ft. below water level. "The information thus obtained," says Mr. Kirch, "will affect the design of the structure considerably." It will also affect the profit-and-loss balance of the contractor who might have taken the job ignorant of the real subsurface conditions. The vigilance of the state highway department in providing dependable information in advance has happily avoided that contingency.

CONSTRUCTION METHODS

A monthly review of modern construction practice and equipment

PUBLISHED BY
MCGRAW-HILL PUBLISHING COMPANT, INC.
TENTE AVENUE AT 16TH ST., NEW YORK

Welding Approved

WIDER application of welding in building construction is made possible by the action of the Pennsylvania Legislature which has just enacted a building-code law permitting welding as an erection method in first-class cities. Numerous municipalities in other parts of the country are at present revising their building codes to authorize the erection of welded structures. Welding has been successfully applied to at least fifty buildings in this country, varying in height from one to eleven stories. The one containing the greatest amount of steel is a factory building constructed for the General Electric Company in Philadelphia and described in Construction Methods, May, 1928. Two model codes for welded buildings are now available, one recently adopted by the American Welding Society and the other by the Pacific Coast Building Officials Conference.

640

For Accurate Bids

An innovation appears in the new form of contract and specifications for highway work in Massachusetts this year. Bidders, in their proposals, are required not only to specify unit prices in both words and figures for each item but also to show the products of multiplying the respective unit prices by the quantities for each item, as well as the total amount of the bid. The new requirement, it is claimed, induces more careful preparation of bids by contractors and saves their time as well as that of department officials at the opening of bids. The last-mentioned benefit, according to the New England Road Builders' Association, is no small one, as contractors will testify who have sat around on a hot day listening to the monotonous reading of a multitude of unit prices, item by item.

9

Coming—Pictures of practical applications of safety principles.

To Know, to Think, to Plan

NCE man was but a generator of power.

He bent his back to the drudgery of production and by sheer brawn wrested a living from his environment. The only power he knew was measured by his

Then, through the vision of a gifted few, he contrived the first rude machines to multiply his puny strength. And eventually he learned how he might harness to them the breath of the winds, the flow of the waters, the expansion of steam and the explosion of pent gas. The day of mechanical power had dawned.

So man, no longer a generator of power, became a director of power.

The strong back gave way to the skillful hand. The plodder deferred to the planner. Brawn yielded to brain. In his new rôle man found that he must know more and think more and plan more.

He must achieve a mastery of all the agencies that made possible his new day.

He must know his machines and the powers that drive them. He must learn their capacities and their limitations. He must encompass the infinite variety of their usefulness. Most of all, he must march always abreast of their swift improvement, for he has learned that every day is but the record of a forward stride; that each year but marks another milestone of progress.

More recently than other crafts, the constructor has turned to mechanical power on a vast scale. And so he has come to feel the need for this new knowledge and new skill. Construction Methods has been planned to help him achieve them; it seeks to foster the progress of construction practice so that man, the builder, may be enabled to use his new tools more freely, more wisely, more productively.

Cillard

McGRAW-HILL PUBLISHING COMPANY, INC., Tenth Ave. at 36th St., New York, N. Y.

JAMES H. McGRAW, Chairman of the Board MALCOLM MUIR, President JAMES H. McGRAW, Jr., Vice-President REDWARD J. MEHREN, Vice-President MASON BRITTON, Vice-President EDGAR KOBAK, Vice-President HAROLD W. McGRAW, Vice-President C. H. THOMPSON, Secretary.

NEW YORK District Office, 285 Madison Ave. WASHINGTON, Colorado Building CHICAGO, 520 N. Michigan Ave. PHILADELPHIA, 1600 Arch St. CLEVELAND, Guardian Building ST. LOUIS, Bell Telephone Building SAN FRANCISCO, 883 Mission Street LONDON, 6 Bouverie St., London, E. C. 4

Cable Address: "Machinist, N. Y."

Publishers of

neering News-Record American Machinist
r Chemical and Metallurgical Engineering
ge Engineering and Mining Journal
lingenieria Internacional
ransportation
icial World Electrical Merchandising
Industries Construction Methods Power Chemical a Coal Age Eng Radio Retailing Bus Transportation Electrical World Food Industries

Electrical West (Published in San Francisco) American Machinist—European Edition (Published in London) SUBSCRIPTION PRICES: United States and the Possessions, Canada, Mexico and other countries taking domestic postage rates, \$1 for two years. All other foreign countries, \$2 for two years. Single Copy, 5 cents. Published monthly. Entered as second class matter, Cotober, 1926, at the Post Office, New York, N. Y., under the act of March 3, 1879. Printed in U. S. A., Copyright, 1929, by

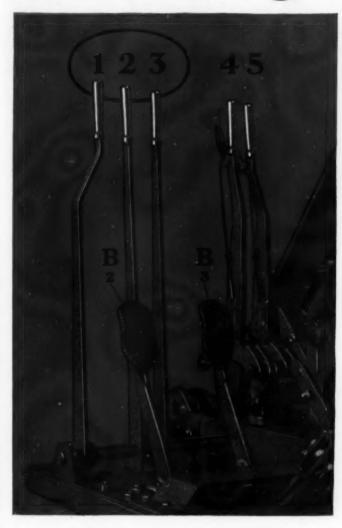
McGraw-Hill Publishing Company, Inc.

CHANGE OF ADDRESS.

CHANGE OF ADDRESS
Subscribers are requested to send both the old address and the new address when they move to a new address.

Member—Audit Bureau of Circulations Member—Associated Business Papers.

It's Easy to Operate



BYERS BULLDOG SHOVEL

- I To swing the cab left or right
- 2 To crowd dipper into bank or draw it out
- B2 Crowd brake
- 3 To hoist dipper
- B3 Hoist Brake
- 4 Steering clutches for travel
- 5 Steering brakes to stop travel



Spot the Dipper instead of the Truck

YOU know that big production day after day depends on more than just putting the right shovel on the right job.

The operator, and how he fits the shovel, helps or hinders daily output. Simplified operation and levers that work with the operator instead of against him are found on Byers Bulldog Shovel. Byers operators never need to push one lever with their knee while both hands are busy on other controls.

Three easy acting short-throw hand

levers and two foot brakes that work with astonishing ease, control all working operations as shown above.

What could be simpler?

This easy arrangement for the operator, plus his "look-out" position in the front left corner of the cab, keeps him happy and helps him give the boss more big days of work.

Contractors are asking for Byers Bulldog Catalog. Write for your copy.

THE BYERS MACHINE CO., Ravenna, Ohio

Byers 1½ yd. Master Shovel, Crane, Dragline Byers ½ yd. Bulldog Shovel, Crane, Dragline, Trencher, Skimmer Byers ½ yd. half circle Bear Cat Shovel, Crane, Dragline, Trencher. Skimmer

SALES AND SERVICE THROUGHOUT THE COUNTRY

BYERS BULLDOG



-too much money is wasted on Wood Forms

Faster

Cheaper

Better Jobs

Catalog No. 1107 will tell you how

BLAW-K

BLAW-KNOX COMPANY
686 Farmers Bank Bldg. Pittsburgh, Pa.
Send me a copy of your Bulletin No. 1107

—Blaw-Knox Street and Sidewalk Forms.

NAME ...

COMPANY

STATE

PRECISION Setting Steel with the MARIABI

Y a slight change the Accelerator Control of Northwest Variable Speed tor can be turned into a chanical retard that will slow speed of the engine way down. The engine of eliminates the grabbing of clutches and makes possible easy shifting of the load as as % inch at a time.

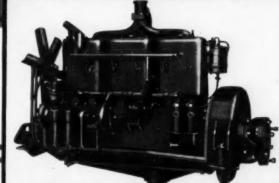
ry construction company ald know more about this usive Northwest feature.

North

NORTHWEST ENGINEERING CO.

The world's largest exclusive builders of gasoline and electric powered shovels, cranes and draglines

ilding 28 E. Jackson Boulevard Chicago, Ill., U. S. A. 1723 Steger Building



NORTHY

FLASH! FLASH! FLASH!

All night long . . . The Eveready Portable Flasher saves lives—but it saves dollars as well!

THE new Eveready Portable Flasher is always on the job. The strongest gale cannot blow out the warning intermittent light of this remarkable flasher. Drenching rain cannot affect it. No matter how bad the weather is—the Eveready Portable Flasher warns of danger with its penetrating warning beam. Protects lives! Prevents accidents!

And it is economical to maintain. The new Eveready Portable Flasher, burning continuously for a year, will cost about \$10 for new batteries. Four ever-reliable Eveready Dry Cells will last two months and longer. The flasher requires no daily inspections, and thus eliminates the up-keep expense of human attendance.

The intermittent flash-stop-flash warning signal increases visibility and even increases the service from the Eveready Batteries. The Eveready Dry Batteries actually recuperate in the short intervals of inaction. This increases economy of operation. Gives longer life. A steel hasp through which a chain may be passed and locked protects against theft. Many city managers, highway commissioners and construction engineers use this flasher as a warning signal wherever and whenever temporary hazards are created. National Carbon Company distributors will be glad to show you the new Eveready Portable Flasher and give you complete details.

NATIONAL CARBON CO., INC.

New York, N. Y.

Branches

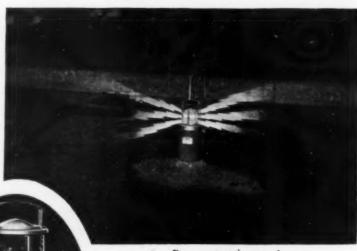
Atlanta Chicago Kansas City
Long Island City San Francisco
Unit of
Unit of Carbon Corporation

EVEREADY PORTABLE FLASHER

- dry battery operated



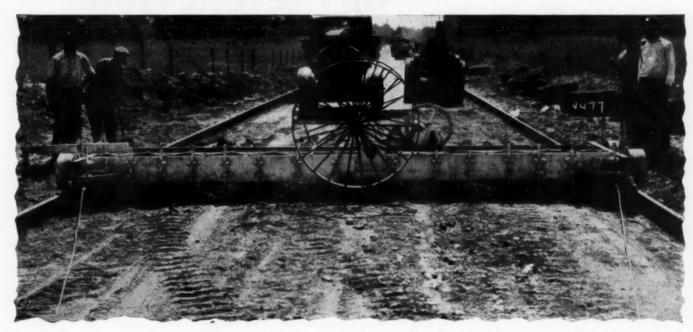
As a traffic warning



For construction work

Specifications—Height 16 inches. Diameter of base 7 inches. Weight, including batteries, 16½ pounds. Requires four standard Eveready 6-inch Dry Cells connected in series to deliver 6 wolts. Extra 6-volt lamp inside battery housing. Battery compartment constructed of seamless steel attractively finished in red. Top of flasher cadmium plated for weather protection. Heavy fresnel-type glass lens in white, red or other colors. Padlock for battery compartment with an extra-long hasp so that the device can be chained. This flasher is of rugged construction throughout and entirely weather-proof.

And Now....



Adjustable to Five Foot Variation



A cast steel plow point over the ends of the center blades covers the joint and prevents clogging or gouging.



The cutting blades are mounted on slotted angles. Adjustment for crown is quickly made.

THIS means that you can get, at small additional cost, a Lakewood Subgrader adjustable from 15 to 20 feet or 20 to 25 feet, in one foot variations. No extra change parts to buy—just extend the frame out to the desired width for the particular job at hand.

The advantage of a Subgrader, in saving time and money, is now generally recognized. Think of having one machine adjustable for 15, 16, 17, 18, 19 or 20 feet.

The improved transportation wheel mounting means real safety and the Subgrader still saves its cost in every mile of road you build.

Complete details in Bulletin 4(-C



of the Chevrolet Six Cylinder Trucks



1 SIX-CYLINDER PERFORMANCE

Powered by a rugged sixcylinder valve-in-head engine—Chevrolet trucks provide remarkable smoothness, flexibility and acceleration—even when hauling a capacity load.

2 AMPLE CAPACITY

A longer, stronger, heavier frame makes possible the mounting of any body type, with loading space up to 9 feet in length and a gross load limit of 7000 lbs.

3 OUTSTANDING ECONOMY

Improved carburetion and a new high-compression, non-detonating cylinder head provide gasoline economy which is actually as great as that of a four-cylinder truck.

4 DAY-AFTER-DAY DEPENDABILITY

Numerous notable mechanical advancements, combined with extraordinary staunchness of construction, make the new Chevrolet six-cylinder trucks unusually dependable.

5 SMART APPEARANCE

A wide array of body types not only meets every haulage and delivery requirement—but provides unusually smart appearance and the utmost convenience.



Contractors know-

—that the swift pace of today's traffic conditions demands the increased power, speed, flexibility and acceleration of a sixcylinder engine. And because the new Chevrolet trucks provide this six-cylinder performance with the economy of the four, their popularity is growing by leaps and bounds in every section of the country.

Visit your Chevrolet dealer today and see how completely the new Chevrolet trucks meet the requirements of your business. In performance, in convenience and in handling ease—they will prove a revelation. And they are as economical, both to own and to operate, as any truck you could buy.

CHEVROLET MOTOR COMPANY, DETROIT, MICH.

Division of General Motors Corporation

The Sedan \$595 The Light De-\$ 400 The 11/2 Ton \$545 The 11/2 Ton \$650 Chassis with Cab 650 All prices f. o. b. factory, Flint, Michigan

- A SIX IN THE PRICE RANGE OF THE FOUR

Mail THIS Back

BUCYRUS-ERIE COMPANY South Milwaukee, Wis.

Gentlemen: As offered in Construction Methods please send your new 64-page book "Making More Money with the Gas+Air"—giving reports from owners, and photos of their work.

Your Name)

(Company Name)

(Address)

((14+)

and get TH New book that shows how

owners are

"Making More Money with the Gas--Air"

This new 64-page book—which is Free—is chockfull of actual reports from owners of Gas+Air BUCYRUS-ERIES.

It shows the bigger outputs that hundreds of Gas+Air machines have been producing on highway grading, cellar excavation, and every other class of work—in rock, stiff clay, and earth. Also on dragline and crane service.

On every page are photos showing what the machines were up against.

Building More Gas-Airs

The 1929 production schedule for Gas+Air machines shows the increase in demand for this real Big Production gasoline machine—

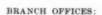
And more Diesel+Airs are being built, too, for locations where fuel oil proves cheapest.

To understand the popularity of these machines—MAIL BACK THE COUPON at the top of this page! Check up on the unequaled results that users of Gas+Airs have been able to get.

BUCYRUS-ERIE COMPANY

Plants: South Milwaukee, Wis.— Erie, Pa.— Evansville, Ind. General Offices: South Milwaukee, Wis.

Evansville, Ind.



Boston New York Philadelphia Atlanta Birmingham Pittsburgh

Making More Money

Buffalo Detroit Chicago St. Louis Dallas San Francisco

Representatives throughout U. S. A. and Canada Offices and distributors in all the principal countries

BUCYRUS

Adv. 752

Through CENTRAL SOUTH CAROLINA, on a road that's lastingly smooth



The invitingly smooth concrete highway which spirals over and around South Carolina's mountains from Newberry to Columbia. Saleguarded against climatic strains by Carey Elastite Expansion Joint, installed at thirty-foot transverse intervals.

RICHLAND County, South Carolina is studded with mountains. The concrete road to its Capital is spiraling, sheer-graded, sharp-angled. But smooth—surface-smooth, every furlong—because it is given the perfect protection of Carey Elastite Expansion Joint.

The "give - and - take," weather - proof

sandwich joint. Fibrous asphalt, pressure-bonded between holding sheets of asphalt-saturated felt. Carey Elastite Expansion Joint! It protects concrete, lastingly, against expansion stresses and contraction strains—keeps the road invitingly and permanently smooth. Easily installed; economical; indispensable. Have us send you installation particulars.

THE PHILIP CAREY COMPANY, Lockland, CINCINNATI, OHIO

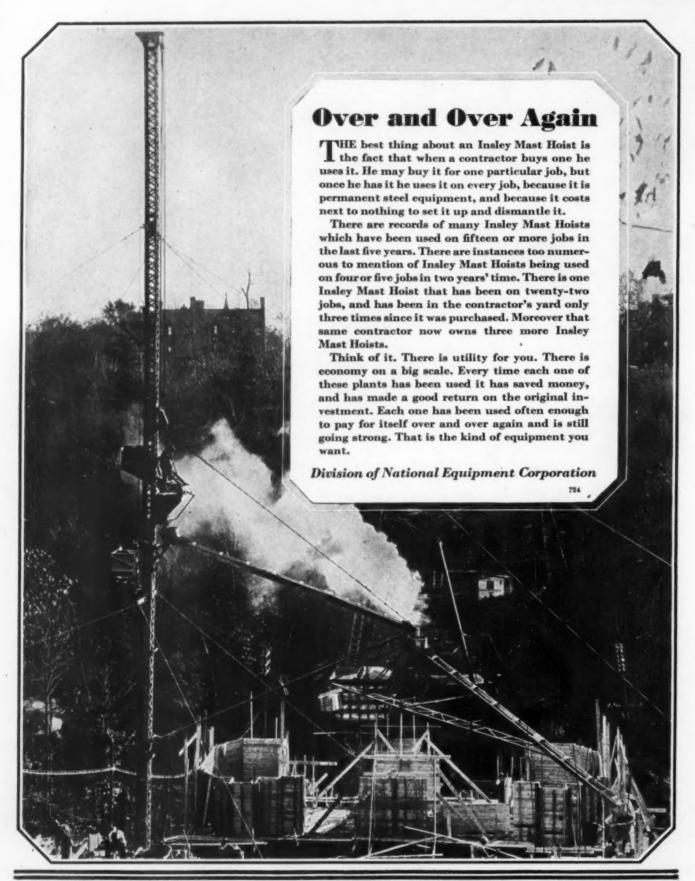




A Mouthful At Every Bite Exceptionally fast closing and dump. Exceptionally fast closing and dump-ing action distinguishes this Owen as the "K" Hi-Speed Bucket. It is built the "K" Hi-Speed Bucket. the "K" Hi-Speed Bucket. It is built for rapid rehandling and for long for rapid rehandling—and for long life as well. It is highly favored to He as well. It is nighty favored for transferring, loading and unloading transferring, loading and unioading loose materials. It gets away with a oose materials. It gets away with a bigger day's work than any other bucket of the same weight and cabucket of the same weight and carand and in less time. and for a pacity under guarantee. Send for that's under guarantee for the complete Type "K" Folder, 17 Features. story of an Owen's 17 Features. story of an Owen's 17 Features.

THE OWEN BUCKET COMPANY THE UWEN BUCKET CUMPANY
6023 Breakwater Avenue . Cleveland, Ohio

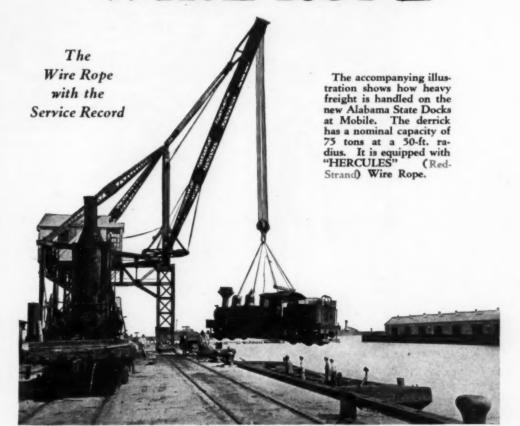








REG. U.S. PAT. OFF. REG. U.S. PAT. OFF.



Strength Plus is Necessary

Wire rope that is used on material-handling equipment must be strong -but strength alone is not sufficient if both safe and economical results are to be had.

The service record of "HERCULES" (Red-Strand) Wire Rope has proved that it not only has the necessary strength to handle heavy loads, but it also has the toughness and endurance to withstand the wear and tear of friction, bending, jerking, etc.

"HERCULES" (Red-Strand) Wire Rope is made of acid open-hearth steel wire, and every wire is rigidly tested by us to make sure that it has every quality that hard work requires.

Made only by A. Leschen & Sons Rope Co. Establish 1857

ST. LOUIS

New York



STEEL-you know it is right-STEEL



THERE never is any question about the quality of structural steel. Steel is proved right in the making. It is worked and reworked . . . rolled again and again . . . and every manufacturing operation is controlled by tests and analyses.

Long before a steel member appears on the building site it has been proved, through and through, time and time again. Architects and engineers working with steel know steel's every property before it goes into construction. No other building material provides such accurate knowledge of its characteristics—consequently none can be used with the same confidence.

This modern age is an age of steel—for every kind of building or bridge in every size. Modern efficiency calls for saving of building time and material, more floor space, less weight, less bulk—quicker returns. Only steel is good enough to provide all these.

A Technical Service Bureau is at the disposal of architects, engineers, owners and others who have need of any information which can be supplied through the American Institute of Steel Construction, Inc.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.

The co-operative non-profit service organization of the structural steel industry of the United States and Canada. Correspondence is invited. 200 Madison Avenue, New York City. District offices in New York, Worcester, Philadelphia, Birmingham, Cleveland, Chicago, Milwaukee, St. Louis, Topeka, Dallas and San Francisco, The Institute publishes twelve booklets,

STEEL

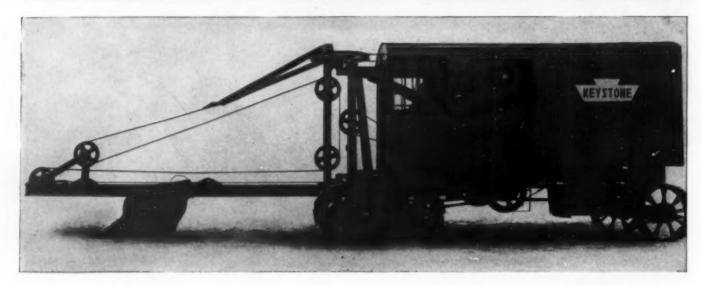
INSURES STRENGTH

AND SECURITY

one on practically every type of steel structure, and provides also in one volume, "The Standard Specification for Structural Steel for Buildings," "The Standard Specification for Fire-proofing Structural Steel Buildings," and "The Code of Standard Practice." Any or all of these may be had without charge, simply by addressing the Institute at any of its offices,



SKIM IT



It seems too bad to disturb the solid sub-grade of an old street by Hacking, Ploughing, Rooting, Blasting, and Undercutting with a dipper or shipper-shaft shovel. And it is not necessary.

Skim it with a KEYSTONE



AGENCIES IN ALL PRINCIPAL CITIES THE heavy \(^5/8\)-yard Keystone Skimmer with 14 feet of level, perfectly-controlled, horizontal crowd, will peel off the old worn surface and leave the sub-grade undisturbed.

That is the modern, economical way to handle a street repaying job. May we tell you more?

KEYSTONE DRILLER COMPANY, BEAVER FALLS, PA.

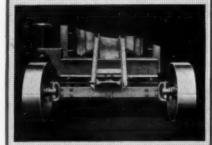
Branch Offices: 170 Broadway, New York City;

Waukegan, Ill.; Joplin, Missouri

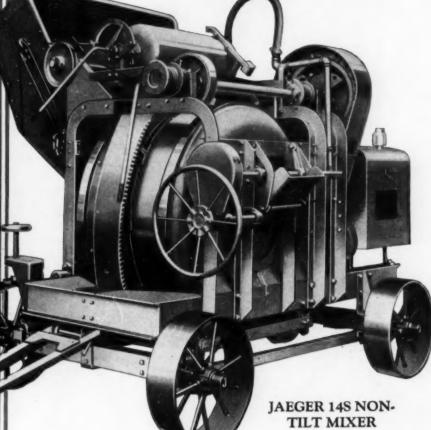
9-D-44

KEYSTORE SKIMMER PULLSCOOP

THE ORIGINAL ONE MAN END CONTROL



PIVOT AXLES make for easier trailing. Note jack for taking loader thrust when charging.

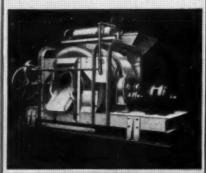


Faster, more Compact, more Portable Half-Yard Mixer!

FROM Automatic Skip Shaker to Pivot Axles, this mixer is an engineering achievement—smooth, fast (with Skip Shaker charger, fast discharging drum), nearly 1,000 lbs. lighter (because of steel construction) and really portable.

Drum runs with machined steel tracks on chilled face ground car wheel rollers with ball bearings—minimum power and wear. One man end control is an original Jaeger feature. Construction is far sturdier than average 14S machine. First cost is moderate; operating savings are real. We can prove it.

Get Specifications and Prices on this and famous SPEED-KING end discharge 7S—other Non-Tilters up to 28 ft. Tilters 3½ to 14S—PUMPS—TOWERS.



90 in. WIDE SKIP can be furnished

for charging from truck bodies.

DIRECT MOTOR DRIVE, Batch Hopper, Track Loader, Skids or Wheels

THE JAEGER MACHINE CO., 800 Dublin Ave., Columbu Please send catalog, prices, terms on Non-Tilt Mixer	Date_	
Name		
Address		
CityState	 	
- Chy		

JAEGER STOCKS AND SERVICE AVAILABLE IN OVER 100 CITIES OF U. S.



Real Value to you Genuine O. Ames

Good steel, good handles are not day your men use genuine O. Ames enough. The tool that lightens the workman's task will produce more work for you. It's the easy lift, full swing, clean load and a grip that has all day comfort, that is made possible with the famous Ames Bend and the new Ames R-MOR-D handle. This is the real value to you, every

shovels.

The complete "All Star" Ames line includes the genuine O. Ames Four Star, the Ames 3 Star and the Ames 2 Star, to meet every need. It will pay you to "look for the stars" on every shovel you buy.

More Ames Shovels are used than any other kind



NORTH EASTON <--> MASSACHUSETTS

ST. LOUIS, MISSOURI

ANDERSON, INDIANA

At the GOLDEN GATE

REPEAT

MARIO! TYPE

SIBLEY GRADING & TEAMIN COMPANY, SAN FRANCISCO.

The new 1¼ yard Type 450 Gas-Electric owned by

Sibley Grading and Teaming Co., San Francisco.

This is the third Marion Shovel owned by this company. Their confidence in Marion equipment is a source of sincere satisfaction and of solemn obligation. When better shovels are built, Marion will build them.

THE MARION STEAM SHOVEL CO. MARION. OHIO. U. S. A.

MARION

CONSTRUCTION METHODS-June, 1929

Page 19



Frank E. Hall 152 W. 42nd St. New York City-

Wilcox Brothers, Inc. 588 Chenango St. Binghamton, N. Y.

E. J. McHarg & Co. 31 Crestmont Rd. Binghamton, N. Y.

MultiFoote Sales Company 281 i West Fulton St. Chicago, Ill.

> Burton Franklin Volunteer Bldg. Chattanooga, Tenn.

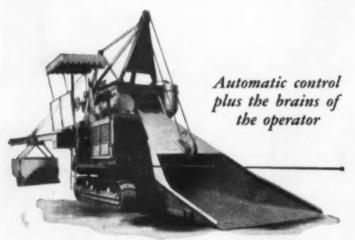
Edward R. Bacon Company Folsom at 17th St. San Francisco, Calif. The MultiFoote Power Operator clips off the seconds lost in manual operation eliminating that loss of co-ordination that makes the mechanical mixing cycle impractical.

Write the nearest general agent.

THE FOOTE COMPANY, Inc.

of NUNDA, N.Y.

World's largest exclusive builders of road pavers





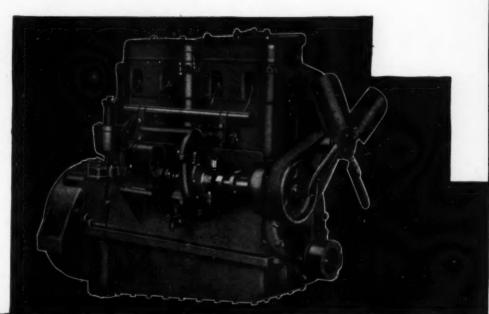


DEPENDABLE

GIVING full-measure power always — day in and day out — makes the Le Roi an engine of unmatched dependability. Its field performance gives testimony to this claim — its wide acceptance is further proof!

Besides being a dependable engine of liberal rating — the Le Roi costs less to operate per day and per year.

The Le Roi is an engine of unusual merit — of extraordinary ability. Look to it for dependable Power.



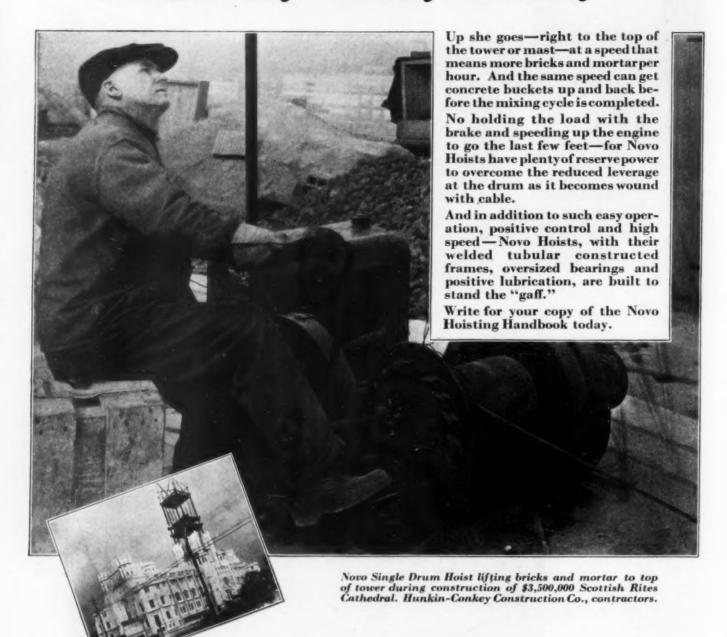


LE ROI COMPANY, MILWAUKEE, WIS.

EROI FINGINES
3 to 170 HORSE POWER

UP SHE GOES!

Smoothly—Surely—Swiftly



NOVO ENGINE COMPANY, 214 Porter Street, Lansing, Michigan CLARENCE E. BEMENT, Vice-Pres. and Gen. Mgr.

PUMPS - ENGINES - HOISTS

Service, parts and sales in over 70 cities



with UNION

These pictures showing the use of 2 size 1 Union Hammers on the job at Puerta Plata Harbor, San Domingo, by the J. G. White Engineering Corp. of New York, are just four more good reasons why you should "drive with Union."

Photo at left shows this hammer driving a 58 ft. (18 in. sq.) concrete pile.

Photo at bottom shows some of the reinforced concrete piles (63 ft. x 18 in. x 18 in.) driven for the east apron. Average penetration 47 ft. Driving time from 7 to 10 minutes per pile.

Upper right photo shows the hammer driving 58 ft. piles for each approach. Driving time, 5 to 6 minutes; penetration, 45 ft.

Lower right photo shows the hammer reversed for pulling 16 in. octagon piles, 45 ft. long, from old Customs Landing. Average pulling time 20 minutes per pile. Piles were driven in 1918.

There's a Union Hammer for every type of piling—and suitable bases to prevent damage to heads.

Investigate!

UNION IRON WORKS

Engineers and Manufacturers

Engineers and Manujac

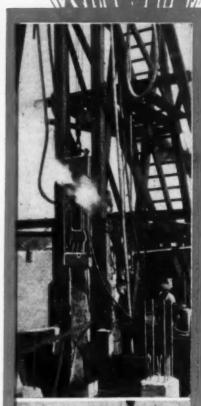
Hoboken. N. J.

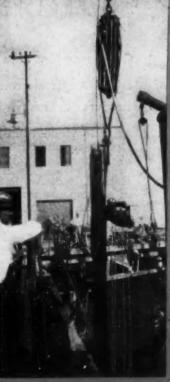
Newark and Grove Sts.

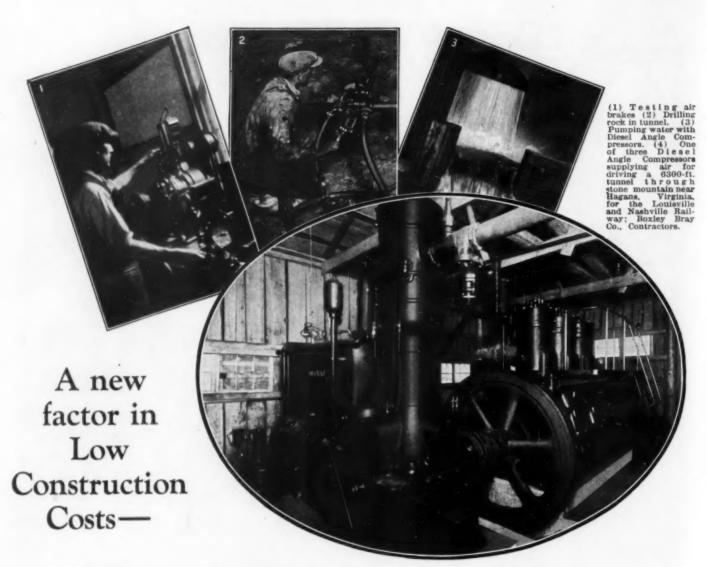
Agents in Principal Cities European Agents—Lidgerwood Limited, Friars House, London











Diesel-Angle Air Power

Oil power hurls a challenge to electricity and steam—in the Diesel-Angle air compressor.

Leaders in many industries are installing these new air power plants—which team the savings of Diesel power, with the economies of Balanced Angle Compressors.

Each Diesel-Angle plant consists of a compressor and engine exactly matched, and designed by specialists. Balanced Angle design makes direct connection simple, and insures dependable service.

You can move a Diesel-Angle plant

from one contract to another, with no worries about electric current frequency, phase, or voltage. Or, on completion of your job, you can easily dispose of the plant, as both compressor and oil engine are complete independent units.

In constructing a New York subway, in a Massachusetts marble quarry, an Illinois water works, and in many other places—Diesel-Angle compressors have replaced other installations at savings ranging from \$500.00 to \$1100.00 monthly.

Investigate the economies of Diesel - Angle air power. Capacities, 313 to 2553 cu.ft. per min. Send for the new illustrated booklet, No. 83-L.

SUL La La IVAN

SULLIVAN MACHINERY COMPANY 816 Wrigley Bldg., Chicago



J. E. CARROLL SAND CO.



BUFFALO, N.Y.

Nevember 9, 1922

The Pate-Root-Heath Company, Plymouth, Onio.

Gentlemen:-

We have been users of Plymouth Gaseline Locomotives for the past six years.

Our first purchase was a three ton locomotive. This gave us such satisfactory service that we purchased a seven ton locomotive in 1921. With this unit we are hauling two special built Koppel Steel Hopper Cars each ten ton capacity, from loading crames to receiving hopper over conveyor belt.

This locomotive is operated by a boy who handles it quickly, efficiently and economically.

We are so well satisfied with our Plymouth that we contemplate the installation of another seven ton locomotive in the Spring of 1923.

Very truly yours,

Hearay ..

May 17, 1924

The Fate-Root-Heath Company, Plymouth, Ohio.

Centlemen:

We do not think it is necessary for us to say anything commendatory of your locomotive. We have said it many times before, in fact you have quoted us. You are at liberty to quote us on what we have already saids. If this is not enough we will be glad to give you another letter.

We have found your gasoline locomotive very satisfactery and the sen at the plant will always use the Plymouth in preference to another make which we have in use there working along side of the Plymouth. That I consider the highest recommendation that can be given to any one.

Very truly yours.

Hearalf co.

September 13, 1920

The Fate-Root-Heath Co., Plymouth, Ohio.

Gentlemen:

We are pleased to advise you that our new 12-ton Plymouth Gasoline Locomotive has been in operation at our Attica Plant fourteen hours per day since the 6th of August and has rendered very satisfactory service. As a matter of fact, we have had no difficulty with it whetsoever.

Yours very truly,

Lator M. Cancoll



60 ton Diesel

Plymouth Diesel Locomotives are built in a full range of sizes from 10 to 60 tons. Designed to reduce fuel and operating costs to a minimum.



Using PLYMOUTHS Since 1916

Their letters reproduced here tell you why.

The last Plymouth bought by J. E. Carroll Sand Co. and shipped to their Attica, N. Y. plant was on August 2nd, 1928. This is the 12-ton Gasoline Locomotive to which Mr. Weston M. Carroll refers in the Sept. 13th, 1928, letter and the one illustrated here.

On October 17, 1928, Mr. J. T. Franz, plant superintendent at Attica, reports this locomotive hauling three cars loaded to 40 tons over a quarter-mile track having a 2 per-cent grade, delivering 1000 net tons of sand in ten hours on 20 gallons of gasoline.

When you pay the price of Plymouths for Locomotives, you deserve Plymouth quality.

PLYMOUTH LOCOMOTIVE WORKS

The Fate-Root-Heath Company 299 Riggs Avenue PLYMOUTH, OHIO

Gasoline and Diesel Locomotives

Ferrobord

TRADEMARK DEG & PAT APPLIED FOR

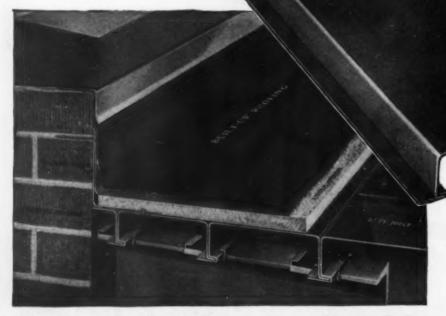
Insulated and Waterproofed LAID LIKE BOARDS

Roofdecks of Truscon Ferrobord are as easily installed as boards. The six inch wide units interlock along their lengths forming rigid reinforcing ribs which are securely attached to the purlins without perforating the roofdeck. Butt Joint Clips securely join ends of Ferrobord insuring

a continuous, smooth surface for application of insulation and waterproofing. (Truscon Ferrobord provides a strong, light-weight, fireproof roofdeck. Its initial low cost is supplemented by savings effected in structural supports. Ferrobord is fur-

> nished in 18 or 20 gage rust-resisting Armco Ingot Iron and in two depths of ribs. Write for complete information and literature.

The three types—Ferrobord, I-Plates and Ferrodeck—meet any roof condition in new buildings or replacement work.



Section Showing Ferrobord Roofdeck, Insulation and Built-Up Roofing



TRUSCON STEEL COMPANY Youngstown, Ohio

STEELDECK ROOF DIVISION Trussed Concrete Steel Company of Canada, Limited, Walkerville, Ont.

Warehouses and Offices in Principal Cities of the United States and the Dominion of Canada

CO

World's greatest drawbar horsepower

-backed by the world's greatest Manufacturer of power machinery



SEVENTY-FIVE Price \$5350 F. O. B. Springfield, Ill.



Here the Monarch "50" is shown with buildozer attachment, moving great masses of solid rock for the foundation of a new drive over-looking the Hudson River.





THE Allis-Chalmers-Monarch provides the greatest drawbar horse-power, per dollar of cost, of any track-type tractor in its class!

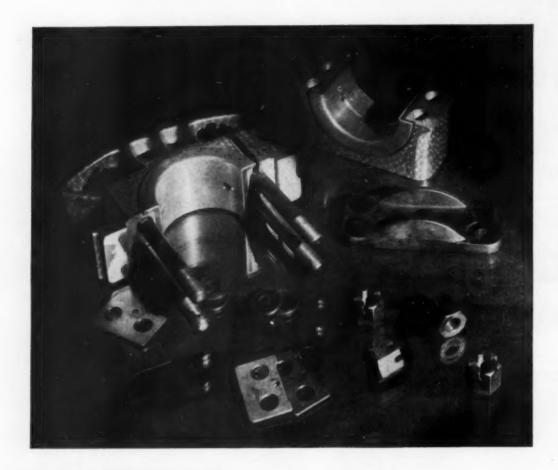
From an engineering standpoint, the Allis-Chalmers-Monarch represents the supreme achievement of engineers whose mechanical accomplishments are famous the world over. Allis-Chalmers believes that manufacturing methods, is the primary factor in determining the value of a tractor to a buyer.

"Well-Engineered" is stamped on every part of the Allis-Chalmers-Monarch. It embodies a wealth of features, such as an Oil Pur-O-Lator, Air Cleaner, pressure lubrication system, modern engine, etc.

Investigate Allis-Chalmers-Monarch today. It is a money-maker for

ALLIS-CHALMERS MANUFACTURING CO. Specialists in Power Machinery Since 1846 Monarch Tractors Division





The WHY Y of reinforced bearing caps



L-HEAD ENGINES
THEY TAKE BETTER
CARE OF THEMSELVES

An engine is no better than its parts. Waukesha Engines are famous for their remarkable stamina, only because the design of each part directly contributes to the extra rigidity of the whole engine structure.

In many models, Waukesha crankshaft bearings are fitted with steel backed bearing caps, held in place by four heat-treated, alloy steel, stud bolts. Extra deep, ribbed and trussed, they afford the shaft a solid support

—and at the center, between the bearing studs, the reinforced steel backed cap prevents distortion. Positive shaft alignment is assured. Without this absolute bearing rigidity—wear, vibration and overheating would be excessive—result, a tremendous loss of power. That's the why of Waukesha bearing construction.

Write today for descriptive bulletin. Industrial Equipment Division, Waukesha Motor Company, Waukesha, Wisconsin. Offices: 8 West 40th St., New York; 7 Front St., San Francisco.

952

-- WAUKESHA ENGINES



THE TOOL OF A THOUSAND USES"

> TAIL CHAIN RELEASE LOCK

Patent Applied For

chor Puller-jack

COSTS \$ COMPLETE ONLY

LOAD CHAIN

- CO C- C SWIVEL

ANCHOR PULLER-JACK

DOES AS MUCH AS 36 MEN

Sheave Block included in stand-ard equipment; used to double the pulling power, or in making vertical lifts, pulling around corners, or in cramped quarters.



On structural steel work, members in place for bling. Also pulls together te forms, coffer-dams, etc.



Tightens guy wires on derricks and towers, stretches into place aerial cable ways. Used for wrecking, pulling down walls and structures, moving build-ings.



When a loaded truck is ditched or mired, get it going with your "Anchor" Puller-jack. One man does the trick. Also used for warping and handling barges





A One-Man Gang

NEW, a quicker, cheaper way to handle the jobs of pulling, moving, lifting heavy loads. For most purposes the chor" Puller-jack does the work of chain hoists, lifting jacks, "Anchor" winches, and block and tackle. Lighter than any.

Built Like a Battleship

Standard outfit consists of the machine itself with 3-ft. steel handle, 15-ft. load chain with slip-hook and swivel, $3\frac{1}{2}$ -ft. tail chain with grab hook, and sheave block.

The chains are special-made of high carbon steel, heat treated; provides a high factor of safety, will not stretch

Sure as a Pinch Bar

The "Anchor" Puller-jack is simple, fool-proof; practically nothing to get out of order. Positive action; always holds. Will not clog with dirt. Built to withstand roughest handling. One man with an "Anchor" Puller-jack does the work of a gang.

Simple as a Sledge

Can be operated in any position—lever upright, upside-down, or sideways; with lever pull toward the load or from it. No instructions are necessary—the "Anchor" Puller-jack cannot be used wrong.

The "Anchor" Puller-jack is only a small machine, it shouts with a 5-ton voice.

You'll need it the day it gets on the job.



carried, easily operated, does the job.

A Strong Pull-A Long Pull

Pulls the length of the load chain without taking a new hold. 15-ft. chain is standard equipment; special lengths as ordered. Quick release lock enables the load to be instantly released under full strain.

A 5-Ton Pull

Certified tests by Pittsburgh Testing Laboratory, Pittsburgh, Pa., STRAIGHT LINE PULL One man pulled 4800 lbs.

Two men pulled 6500 lbs.
WITH THE SHEAVE BLOCK One man pulled 6700 lbs.

Two men pulled 9800 lbs. Tests made with a stock "Anchor" Puller-jack equipped with standard

3-ft. lever; men stood on con-crete floor. Out on the job men can dig in their feet and get a real pull.

Order Today-You'll use it every day

"Anchor" Puller-jack, complete as described, \$36 f.o.b. our works, Reynoldsville, Pa. Shipping weight 82 \$36 lbs. Extra length load chain, quoted

on request. Crated for overseas shipment, \$1 extra.



Carried in stock by leading supply firms in all districts. If your dealer cannot furnish the "Anchor" Puller-jack, order direct from us.

Immediate Shipment.

Manufactured by

T. H. EDELBLUTE COMPANY

3 Oliver Building Pittsburgh, Pa.

Also Manufacturers of "Anchor" Track Braces and "Anchor" Rerailers



Using the sheave block in set-ting a heavy crusher against a wall. The "Anchor" Puller-jack is a labor-saver on every construction job.



Lifts heavy machinery Sheave block as used on a lifting job with "Anchor" Puller-jack.

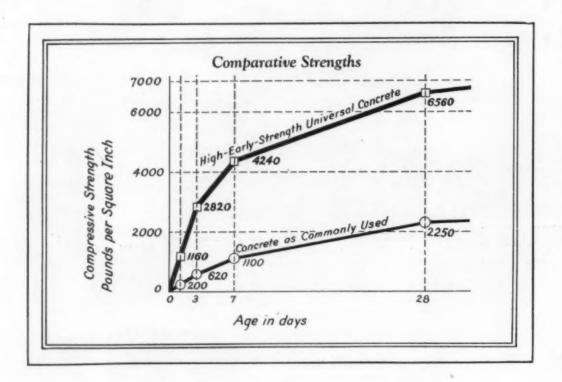




Spots railroad cars anywhere you want them; handles them loaded, up steep grades, with ease. If partly loaded cars run past the loading point, one man gets 'em back quick.



Draw Your Own Conclusions From These Comparative Strength Curves





When You Get One, You Get All Three

lo D

pl

up P&

1. Strong concrete in 3 days

With the usual materials, usual equipment, usual labor and usual Universal cement, you can secure at 3 days concrete that is stronger than ordinary concrete at 28 days.

2. Permanently stronger concrete

As shown in the graph above, High-Early-Strength Universal Concrete not only has a high 3-day strength but is permanently stronger than concrete as ordinarily mixed and placed.

3. Denser and more durable concrete

In addition, the methods by which High-Early-Strength Universal Concrete is obtained produce a denser and more durable concrete.

Description of methods for securing on the job strengths comparable to those shown in the graph (see above) will be sent on request.

One Standard Cement for All Concretes and Mortars

Universal Portland Cement Co.

Subsidiary of United States Steel Corporation

Chicago Pittsburgh Minneapolis Duluth Cleveland Columbus New York

Concrete for Permanence

Construction

MCGRAW-HILL PUBLISHING COMPANY, INC JAMES H. MCGRAW, Chairman of the Boord MALOOLM MUIR, President EDWARD J. MERIERS, Vice-President H. C. PARMELEE, Editorial Director

trating successful construction, maintenance and material-handling methods for general construction, highways, buildings, industrial plants and public works and utilities

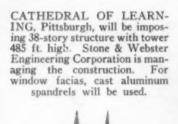
ROBERT K. TOMLIN, Editor

WILLARD CHRYALISM Publishing Director

NEW YORK, JUNE, 1929

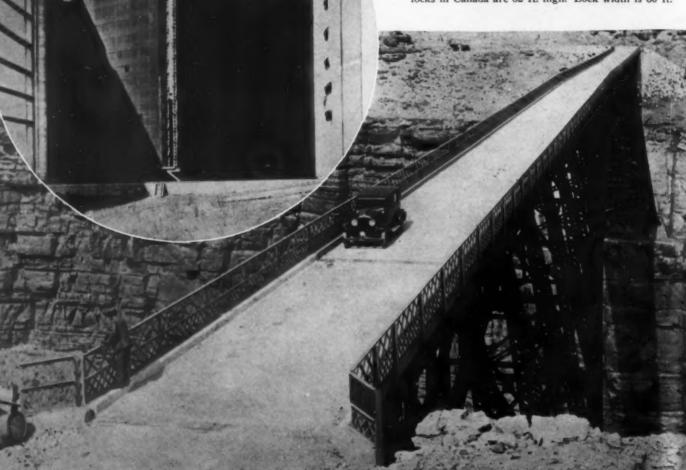
NUMBER 6





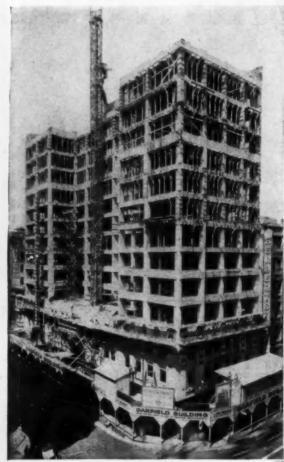
This Month's

HUGE MITRE GATES (left) for Welland Ship Canal locks in Canada are 82 ft. high. Lock width is 80 ft.



OPEN TO TRAFFIC. Bridge with 834-ft. span and 18-ft. road way over Grand Canyon in Arizona is completed.

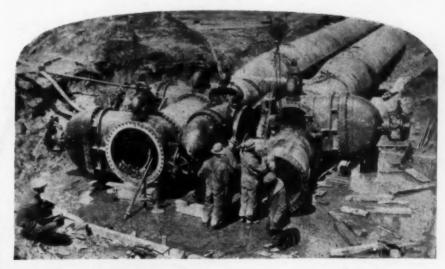
"News Reel"



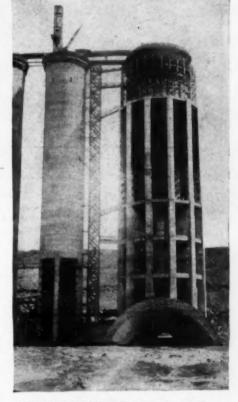
marked completion of Garfield Building, Los Angeles, by Herbert M. Baruch Corporation. Concreting for 14-story concrete structure required only 51½ working days.

Photo from Zara Witkin, chief engineer.

NEBRASKA'S STATE CAPITOL (right) at Lincoln, a \$10,000,000 structure, has central shaft 400 ft. high, nearing completion by Peter Kiewit's Sons, contractors of Omaha. For the masonry work Bedford limestone is being used throughout. The structure covers a site 434 ft. square.



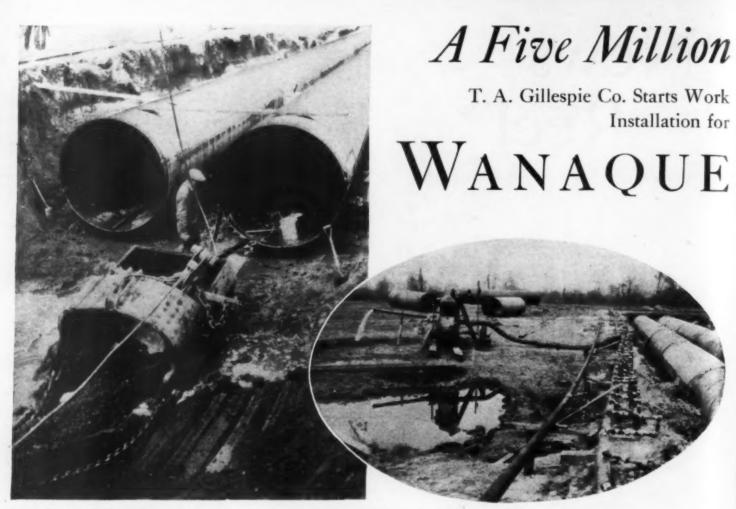
FIRST CROSS-CONNEC-TION, involving five 48-in. valves, is completed on twin line of 74-in. steel pipe for New Jersey's Wan-aque Aqueduct. Further con-struction details on pp. 34-37 of this issue.



INTAKE TOWERS (above) and diversion conduit for world's largest high earth dam on Saluda River, South Carolina, involving fill of 11,000,000 cu.yd., and height of 208 ft. Murray & Flood, New York, are engineers for the structure, which is being built for the Lexington Water Power Co., of Columbia, S. C.



DDS



TRENCH EXCAVATION for the double line of 74-in. steel lock-bar pipe is handled by a 1½-yd. bucket operated by a crawler-mounted dragline with 65-ft. boom.

A WELL-POINT SYSTEM, (above) with riser and header piping along the trench line, lowers ground-water level and allows excavation to proceed "in the dry."

> A 6-TON SECTION of pipe is lifted, swung over the trench and lowered by a crawler - mounted crane.

line of pipe 14 miles long from the Wanaque dam to the Great Notch tunnel (constructed under a previous contract) and a single line of pipe about 4 miles long from the south end of the tunnel to the Belleville reservoir.

In addition to 164,000 lin.ft. of lockbar steel pipe $\frac{7}{16}$ in. thick, the contract quantities include 400,000 cu.yd. of earth and 10,000 cu.yd. of rock ex-



THIRTY-FIVE thousand tons of 74-in. steel lock-bar pipe constitute the principal item in the \$5,127,000 contract for the Wanaque Aqueduct which the T. A. Gillespie Co., of New York, is building under the supervision of Fuller & McClintock, consulting engineers for the North Jersey District Water Supply Commission. The aqueduct contract, in two sections, comprises a double

SPOIL from the trench is deposited alongside, to be used, later, as backfill over the completed pipe line.



June, 1929—CONSTRUCTION METHODS

Dollar Pipe Line

on 74-in. Steel Lock-Bar New Jersey District's

AQUEDUCT



cavation, 100,000 cu.yd. of borrow and 330,000 cu.yd. of refill and embankment. For the most part the construction is a straight cut and cover job, although special construction is called for at several stream crossings.

th

le

ct

X-

THODS

TAPERED PIPE ENDS (in oval) allow one 30-ft. section to be telescoped into the

other as a preliminary to forming the singleriveted girth joints. CRADLES (above) on special, low-mounted trucks carry the pipe during its trip by industrial railway to the trench. Pipe are unloaded merely by rolling off the trucks.



BOLTS are introduced into every third rivet hole to join up the pipe sections prior to the riveting operation. Note soil-proof wrapping to protect pipe exterior.



LOADING PLATFORM where pipe, delivered from highway by motor truck, is transferred to special industrial railway pipe-carrying cradles, illustrated in the picture in the upper right corner of this page.



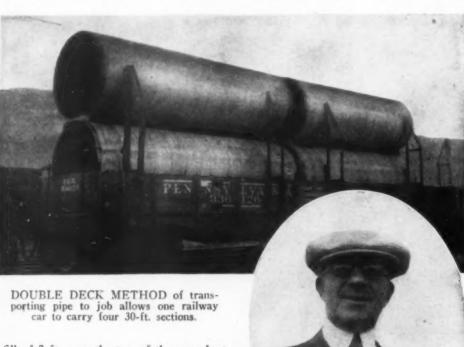
JOINING two sections of pipe in trench. Lock-bars are scarfed at their ends to insure tight fit between sections. Pipe placed by crawler crane.

On the twin line portion of the job the 74-in. pipe are spaced 9 ft. apart on centers, necessitating a trench 16 ft. wide at the bottom. For a portion of its length the aqueduct is located in the bed of the abandoned Morris canal necessitating only a shallow cut. For the single pipe line, the trench width at the bottom is about 5½ ft. A

Republic motor trucks and trailers by crawler crane and delivered to the railhead of an industrial railway serving the aqueduct trench. Here they are transferred to a loading platform and rolled on to low-mounted cradles on narrow-gage railway trucks. Vulcan gasoline locomotives haul the pipe, two at a time, to the trench where they

depositing spoil well beyond the top of the cut on one side of the trench for re-use, later, as backfill.

Trench excavation and pipe laying operations are in progress at three different points on the northerly portion of the line. Trench excavation in earth is handled with Link-Belt and Bucyrus-Erie (Diesel) crawler-



AAA.

STANCHIONS of angle-iron construction, fitted to sides of railway cars, hold pipe securely during transit.

fill of 3 ft. over the top of the aqueduct is specified.

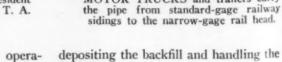
The pipe is fabricated in 30-ft. lengths at the shops of the East Jersey Pipe Co. and shipped to the job in

mounted cranes operating 1½-yd. Blaw-Knox dragline buckets. Other heavy equipment includes Northwest and Koehring cranes and pull-shovels for placing the pipe sections in the trench,



TRIP to place along trench is made by industrial railway and gasoline locomotive.

M. J. COFFEY (above), vice-president in charge of construction for the T. A. Gillespie Co.



flat cars equipped with special stanchions and blocking for supporting one pipe length on top of another. With this double-decking arrangement, as illustrated herewith, one railway car is made to accommodate four 30-ft. pipe lengths.

On arrival at railway sidings near the job the pipe are transferred to are rolled off sideways. The operation generally derails the cradle-carrying trucks, but they are of light weight and are quickly put back on the track.

For excavating the trench for the double line of pipe, the contractor chose draglines with 65-ft. booms and 1½-yd. buckets. The boom lengths give the machines ample reach for

depositing the backfill and handling the removal of rock where it is encountered.

MOTOR TRUCKS and trailers carry

bars an ac is te

then

sled

of th

line

the

supp

gaso

CONST

At some points the presence of ground water required the installation of a Mooretrench well-point system (see p. 34) so that excavation might proceed in the dry.

Construction plant at one of the

June, 1929-CONSTRUCTION METHODS

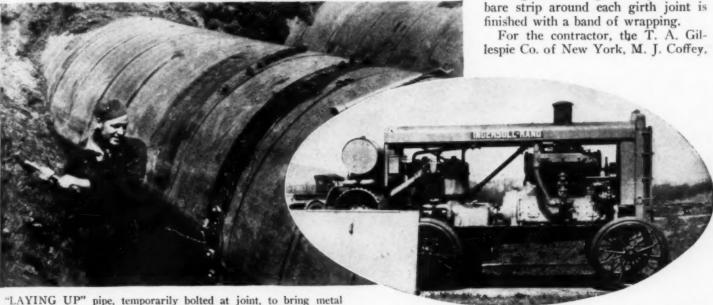
larger river crossings consists of a 10-ton American stiff-leg derrick and a Union hammer for driving steel sheet piling.

After each 30-ft. pipe section (weighing over 6 tons) is lowered into the trench, the girth joint is bolted up temporarily prior to the riveting operation. Each pipe length is tapered

pacities of 300 cu.ft. of free air per minute. In every third length of pipe there is a drop hole for the hose lines from the compressors. For "bucking up" the rivets (as shown in a photo on this page), the contractor uses as a dolly, a heavy sledge with its handle passing under a chain around the pipe to get leverage against the rivet head

while the air gun is working on it from inside the pipe.

Before arriving on the job each pipe length is heated, coated with Ovarco pipe coating applied by dipping and then wound spirally with Pabco soilproof wrapping of felt strips impregnated with a bituminous compound and covered with flaked mica. After riveting and calking is completed, the



'LAYING UP" pipe, temporarily bolted at joint, to bring metal surfaces together prior to riveting.

COMPRESSED AIR, for riveting and calking, is supplied by portable, gasoline-driven units with capacities of 300 cu.ft.



d 1(

arry

way ad.

the

en-

of

tion

stem

ight

the

THODS

CALKING of the single-riveted joints is done with air tools to make pipe watertight.

just enough to permit one end to telescope into the other. The lockbars are scarfed at each end to insure an accurate fit. Every third rivet hole is temporarily bolted and the pipe is then "layed up" by blows from a sledge hammer to bring the steel plates of the two sections into contact.

The girth joint consists of a single line of rivets. Riveting is done from the inside of the pipe using air supplied by Ingersoll-Rand portable gasoline-driven compressors with ca-

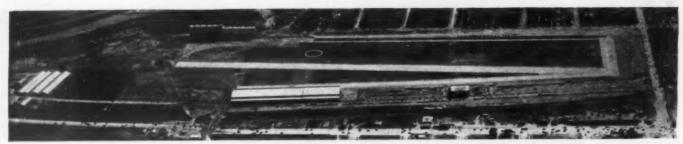


DONALD W. HOWES, construction engineer, who has supervision of all field work for Fuller & McClintock, consulting engineers.



erage to sledge hammer which serves as dolly to "buck up" rivet on which pneumatic hammer is operating from inside of pipe.

vice-president and general manager, is in charge of all construction. For Fuller & McClintock, of New York, consulting engineers for the North Jersey District Water Supply Commission, Donald W. Howes, construction engineer, has supervision of all field work and A. A. Jones is executive engineer, with headquarters in Newark, N. J.



OIL-TREATED LANDING STRIP extends through white circle and is parallel to concrete runway.

Road-Oiling Methods, Applied to New Plane Terminal, Produce

DUSTLESS AIRPORT

ROAD-BUILDING methods, involving surface treatment with hot asphaltic oils, have been applied successfully to produce a dustless, resilient landing area for airplanes at the new Grand Central Air

through cuts thus made in the surface.

After the surface of the field had been smoothed with fresnos and given a uniform slope of 6 in. per 100 ft. to shed water, a single application of road oil with 60 to 70 per cent asphalt

content was made by pressure distributors at 120 deg. F., using ½ gal. per square yard. This method was used on 167,000 sq.yd. of the general surface of the airport.

On the landing strip, however, the

dra was 70 appl deg.

squa catio Afte diskequip

CONST



COARSE SAND, delivered by truck, is first spread over landing strip area to a depth of 4 in. on silt surface.

Terminal in Glendale, Calif., a suburb of Los Angeles. The work involved two different types of treatment, one a light oil application for dust abatement over the field generally, and the other a more extensive operation on a 300x1,500-ft. landing strip where the objective was to produce a surface firm, resilient, waterproof and thick enough (6-in.) to stand up under the gouging of airplane tail skids and to prevent water reaching the subgrade

FRESNOS, hauled by mules, spread the sand layer to uniform thickness

DISK HARROW, hauled by tractor, cuts to 7 in. depth, mixes sand and underlying silt, preparatory to oiling.

treatment involved additional operations. Here the surface material is a fine silt, with which it was found desirable to mix sand in order to combine effectively with the asphaltic oil to be applied. Coarse sand, therefore, was dumped from motor trucks over the entire landing strip area and smoothed off by light drags to form a layer 4 in. deep. The area was then disk-harrowed to a depth of 6 to 7 in., cutting into the silt base 2 to 3 in.

June, 1929-CONSTRUCTION METHODS



WORKING THE OILED SURFACE with road graders, after disk-harrowing, required 40 to 50 trips to blend the material to proper consistency.

riii

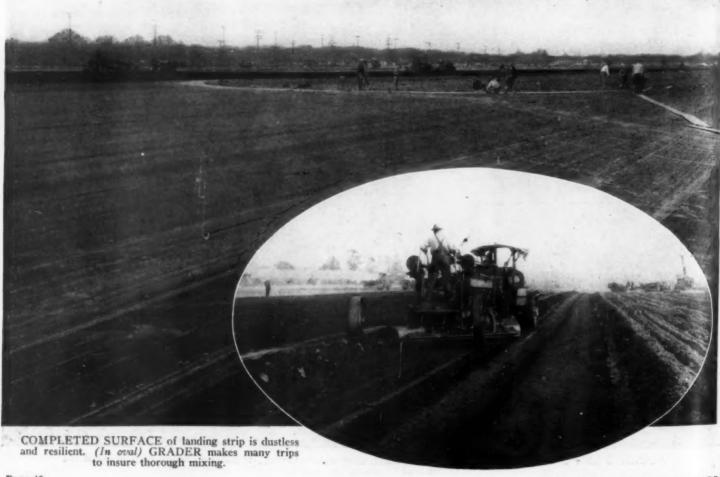
111.

ODS

ROAD ROLLER (left) weighing 8 tons made only one passage of surface so as not to compact material too solidly.



LIGHT TIMBER DRAGS, 8x24 ft., smooth mixed surface to thickness of 6 in. and give slight slope for drainage.

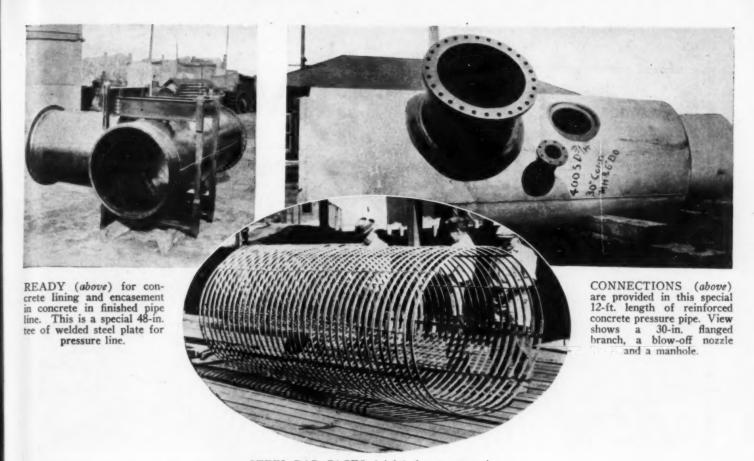


Page 40

June, 1929-CONSTRUCTION METHODS

LAY backf pressi Seque East

CONS



STEEL BAR CAGES (right) for pressure pipe, showing bars securely and uniformly spaced.

CONCRETE PIPE DETAILS



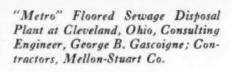
The photographs on this page illustrate a few construction details of reinforced concrete pipe as manufactured by the Lock Joint Pipe Co., of Ampere, N. J.

LAYING (right) and backfilling lock - joint pressure pipe for the Sequoia aqueduct of the East Bay Municipal Utility District, Oakland, Calif. Note short amount of trench open and immediate covering of pipe.

THODS

"METRO"









Means Longer Life and Real Economy on the Floor of any Trickling Filter...

HE final test of any material used in Public Service is its ability to stand up under constant use with little or no maintenance.

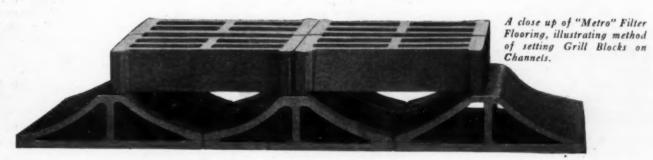
"Metro," the *Original* Vitrified Filter Flooring, offers all the advantages of longer life, freedom from repairs and constant operation.

In design and construction it has ample strength for loads imposed upon it—provides thorough aeration and free drainage to take care of solids and organic growth.

This modern Flooring is the choice of far-sighted communities, as well as large Public Institutions.

Consult Metropolitan for further details.

METROPOLITAN
PAVING BRICK
C O M P A N Y
CANTON - OHIO





ONE OF THE TUNNELS along the route. The road in places is 1,100 ft. above the lake.

WHY 7½ CARLOADS OF EXPLOSIVES WERE NEEDED. Workmen start-ing a hole in solid rock for blasting.

HE removal of 131,147 cu.yd. of rock in building an 8.3-mile stretch of the Slocan City-Silverton highway, British Columbia, Canada, was one of the tasks accomplished by the contractor, L. H. Rawlings & Co., Nakusp, B. C.

This road runs through the richest

mineral belt in the province of British Columbia and involved the heaviest work ever done on a highway in that section of the country, requiring 15 months for completion. Most of the road was cut through wild country, and the first step was to clear the rightof-way of trees and stumps. At places William Ramsey (right), district engineer, and O. P. Roberts, resi-dent engineer, appear well satisfied with results.

BLASTED

From a Canadian Mountainside

the road ran 1,100 ft. above the lake shown in one of the photographs.

Blasting of solid rock for tunnels and galleries required 7½ carloads of explosives. Machines used on the job were: Ingersoll-Rand compressors, Cletrac tractors, Russell graders and Ford trucks. The work was done by contract at unit prices.

L. H. Rawlings, who furnished the photographs and data for this article, supervised the job for the contractor. For the Provincial Government, the district engineer was William Ramsey and the resident engineer, O. P.

Roberts.

June, 1929-CONSTRUCTION METHODS

Mausoleum Is Made

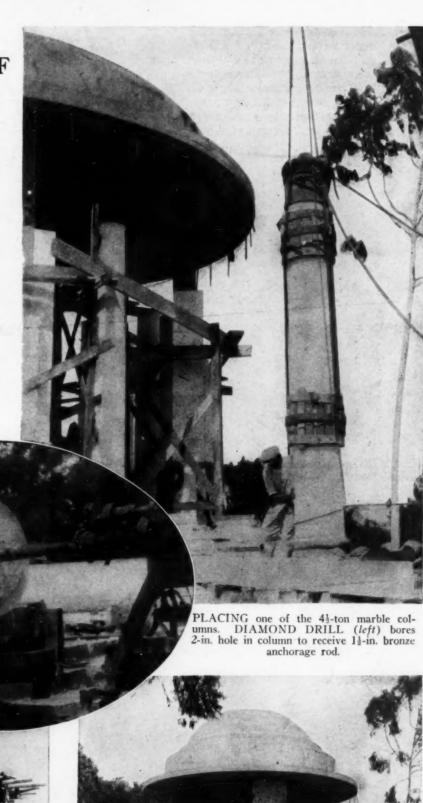
EARTHQUAKE-PROOF

ETHODS of tying a structure together to resist earthquake damage were employed by William C. Crowell, contractor, of Pasadena, Calif., in building the Henry E. Huntington concrete and marble mausoleum, a circular structure 36 ft. high and 90 ft. in diameter at its base.

Radial concrete walls, heavily reinforced, served to connect the footings. A special feature of each 4½-ton marble column is a 2-in. diamond drill hole bored through its entire length to receive a ½-in. bronze rod extending from cornice to base, where it is solidly grouted.

For the concrete dome the forms consisted of ½x4-in. boards supported by ribs cut to shape by a band saw. Reinforcement consisted of ½-in. steel rods placed both ways and spaced 6-in. on centers.

For handling marble the contractor used a 55-ft. stiff-leg gin pole operated by a 25-hp. American hoist. Concrete was raised by electric hoist to a hopper and distributed to forms by carts from a scaffold built around the structure. P. H. Crowell was superintendent of construction.



FORM WORK ready for casting concrete shell. Reinforcement is spaced 6 in, on centers both ways.

CONCRETING COMPLETED. Mausoleum is 90 ft. in diameter at base of steps and 36 ft. high. Diameter of dome is 28 ft.

of job ors, and by the cle, the asey P.

A 1,500-FT. cableway for handling materials and men, and a 360-ft. double-compartment tower and chuting system for concrete placement were among the major items of plant used by Bent Bros., contractors, of Los Angeles, Calif., to complete for the Portland, (Ore.) Bureau of Water the \$1,440,375 Bull Run dam, a concrete structure of the arched gravity

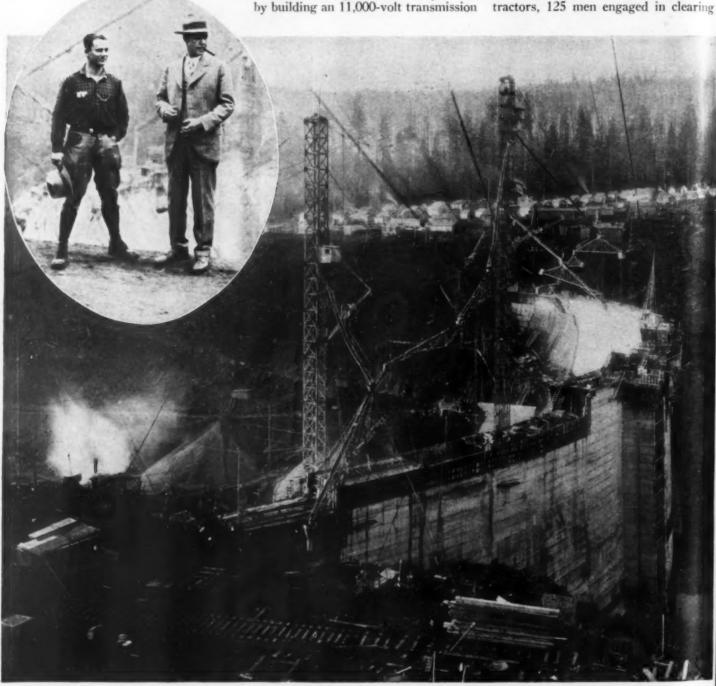
Long Cableway and Tall Arched Dam

steel, 175,000 lb.; 2-in. grout and drain holes 50 ft. deep, 10,000 lin.ft.; cement, (furnished by city at cost of \$2.49 per barrel) 200,000 bbl.

Work was begun in February, 1927, by building an 11,000-volt transmission

ported by standard-gage construction railroad from beds 3½ miles below the dam.

Camp facilities were constructed for 300 men in the crew of the dam contractors, 125 men engaged in clearing



CONCRETE WAS DISTRIBUTED from double-compartment towers, 360 ft. high, feeding a system of 20-in. chutes. (Construction camp for 500 men in background.) (In oval) K. L. PARKER, (at left) superintendent and H. A. HAMLIN, business manager for Bent Bros.

type, 200 ft. high and 950 ft. long. The chief construction quantities involved were: Excavation, 110,000 cu.yd.; concrete, 230,000 cu.yd.; steel reinforcement, 300,000 lb.; structural

line to the site. The location is 10 miles from a railroad, so that material and supplies, including cement, had to be hauled by motor truck to the job. Gravel aggregate, however, was trans-

the reservoir site and 50 men for the city. Located 5 miles above the headworks for the Portland Water supply, it was necessary to enforce strictest sanitary regulations at the camp and

June, 1929—CONSTRUCTION METHODS

count Ag

from
the d
dragl
1½-yo
side-o
site b
tives
dam
const



By K. L. PARKER

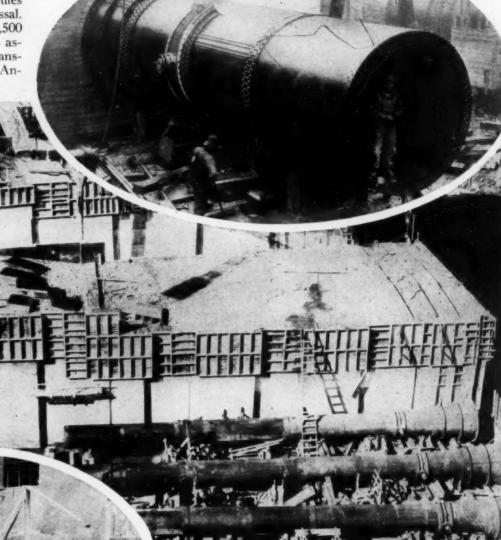
Superintendent, Bent Brothers, Los Angeles, California,

the slightest infraction of the rules was followed by immediate dismissal. A 5-ton Washington cableway, 1,500 ft. between towers, was erected to assist in excavation and provide transportation for men and materials. An-

or

11-

ıg



FORMS for dam were 5x7-ft. wood panels anchored to loops left in previous pour. Pouring was done in 4½-ft. lifts. (In ovals) Steel penstock pipe 96 in. in diameter (above) and balanced needle valves (at left) on 48-in. outlet pipes.

other cable, $2\frac{1}{2}$ in. in diameter, was used to support the concrete chutes and counterweights.

Aggregate for concrete was secured from river gravel bars 3 miles below the dam. The gravel was loaded by draglines (a 2½-yd. Monighan and a 1½-yd. P&H) into 12-yd. Western side-dump cars and hauled to the dam site by 20-ton Vulcan gasoline locomotives on standard-gage track. At the dam the cars dumped into a hopper

the

ead-

ply,

test

and

HODS

with a 12-in, grizzly from which a 30-in, conveyor belt 200 ft, long lifted the material to a Bodinson screening and washing plant over the bunkers.

and washing plant over the bunkers.

The gravel from the river bars contained a large amount of water-soaked sticks and debris. The larger sticks were hand-picked off the conveyor belt, but the smaller ones could not be caught and because of their weight were not removed in the washing process. The problem was solved by in-

stalling blowers which removed the sticks from a falling sheet of gravel by proper regulation of the air currents.

Another feature of the washing plant was the construction of a small reservoir to permit the reuse of washwater. The muddy water could not be wasted into the river as it required days of settlement in the city reservoirs for it to clear.

Concrete placing began during August, 1927, excavation having been started in May, and was continued one shift daily, averaging about 600 cu.yd., except for a period of five months when pouring in the thickest part of

the dam was continued two shifts daily. Pouring of the 230,000 cu.yd. of concrete in the dam was finished in January, 1929, less than two years after the contract had been signed.

Charging cars containing measured aggregate and sand from Blaw-Knox inundators were hauled about 100 ft. by a 4-ton Plymouth gasoline locomotive to hoppers where these batches were dumped directly into two 56-S Smith mixers. The cement which came through chutes from a shed directly above was weighed and added at the same time. Time of mix was 2 min. and only 21/2 min. elapsed between

batches. The mixers dumped directly into the skip of an Insley double-compartment, steel hoisting tower, 360 ft. high, equipped with two 150-hp. Thomas electric hoists.

Pouring was done in 4.5-ft. daily raises, using 5x7-ft. wood panel forms,



NIGHT WORK made it necessary to string lines of 500- and 1,000-watt electric lights over the job.

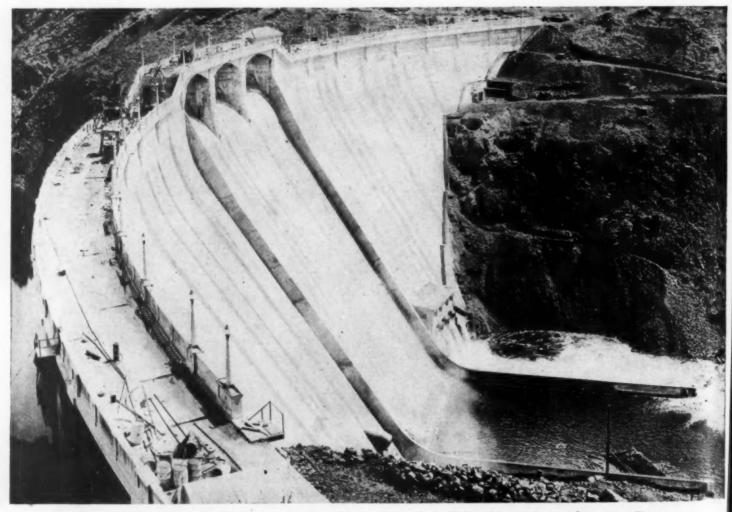
anchored to loops left in the previous pour. On the top of each pour three raised horizontal keys 8 in. high by 20 in. wide were formed as water stops. Skips were raised at a speed of 600 ft. per minute and emptied into 20-in. chutes serving the whole dam.

The largest size of aggregate used in the dam was obtained with cobble screen set to yield a 5 to 7-in. size, giving a maximum size averaging about 6 in. The use of larger size cobbles was tried at first but was discontinued because of clogging of the concrete chute line.

Practically all of the machinery, with the exception of shovels and one hoist, was electrically operated. Night work quired the stringing of 500 to 1000-watt lamps over the job.

Design and supervision of the project for the city of Portland was in charge of Ben S. Morrow chief engineer

of the Bureau of Water. For Bent Bros., the contractors, L. T. Grider was general superintendent for all of the company's construction, H. A. Hamlin, was business manager and the writer was superintendent in charge of the Bull Run project.



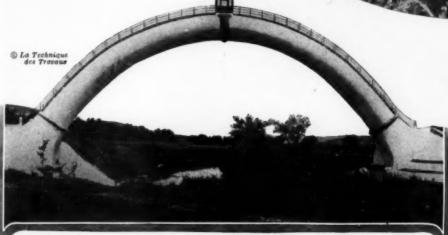
READY FOR SERVICE. Structure curved to 150-ft. radius is 200 ft. high and has center overflow type spillway 120 ft. wide discharging on to concrete apron.

JOB ODDITIES

A Monthly Page of Unusual Features of Construction

MAKING THE GRADE (right)
Here's an Ingersoll-Rand air compressor on a tough assignment. It
had to climb 1,500 ft. up a 41-per
cent grade in the Colorado Rockies
to reach a road construction job
for C. V. Hallenbeck contractor,
Ouray, Colo.

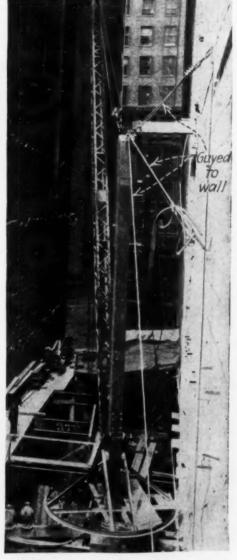




A DUAL PURPOSE is served by this unusual structure. Primarily it's a water supply conduit, but in times of flood on the Rio Majerte it acts as a foot bridge with a clear span of about 120 ft.



PADLOCKED! In excavating for an 18-story building in Milwaukee, the contractor was barred from razing these shacks pending the expiration of a federal prohibition "padlock," applied on evidence of liquor sales after property had been bought but before construction started.



GUYED TO WALLS. This unusual derrick set-up in cramped quarters was devised by Superintendent McGarey of Marc Eidlitz & Son in building 19-story addition to New York store of R. H. Macy & Co. Distance between walls is only about 25 ft.

CHODS

27 Welding Rigs Make Quick



LONG-HANDLED TONGS are used to turn the pipe as the welding progresses. EACH OPERATOR (above) with a 3st-in. diameter welding electrode makes approximately 13 welds in 10 hours.

Page 50

June, 1929-CONSTRUCTION METHODS

adds and compl lines pleted crawle with pipe

made metho ing hi sides ing th side f By

CONST

Work of 200-Mile Pipe Line



When a 200-ft. section is completed, another crew lines it up with the completed pipe line, using a crawler tractor, equipped with crane boom. As the pipe cannot be turned at this stage, the welds are made by the "bell-hole" method, the operator moving his position to weld all sides of the pipe, and making the weld on the lower

side from an excavation dug beneath. By the use of 16-in. diameter welding electrodes and a current of about

TRACTOR AND BOOM (above) line up the 200-ft. sections for welding them to the completed pipe line. PIPE (below) is lined up alongside trench preparatory to welding.

175 to 190 amp., each operator makes approximately 13 welds in ten hours.

After the final welding operation is completed, the joints are tested and then are treated with a corrosionresisting compound, after which the pipe is lowered into the ditch.

The electric arc welding of the entire pipe line is

being done with General Electric units under the direction of Fred Clark and F. G. Hoffman.

CONSTRUCTION METHODS-June, 1929



Paving Mixers
....but they don't lay
pavement

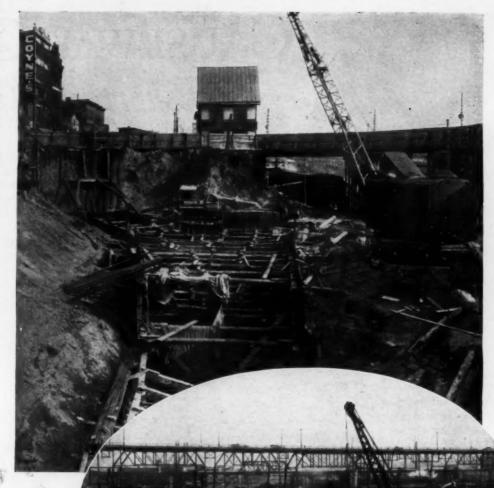


FOOTINGS AND PIERS (left) in the station area are poured with pavers by Spencer, White & Prentis, Cleveland.

develo

TWO 1-YD. PAVERS (in circle), Koehring machines used by Spencer, White & Prentis, pour 15,000 cu.yd. of concrete for the Nickel Plate bridge over the Big Four and terminal tracks at West 30th St. A gasoline crane places the concrete from 1-yd. buckets.

S U B W A Y STRUCTURE AND RETAIN-ING WALL along Ontario St., containing 30,000 cu.-yd. of concrete, are built by Bates & Rogers Construction Co., Cleveland, with a 1-yd. Smith paving mixer. It is here shown above the Y of a depressed track for a rapid transit line. Even in this position trucks deliver batched materials as usual.



F O O T I N G S, COLUMNS, AND DECK (in oval and below) of the Eagle Ave. viaduct were poured by Spencer, White & Prentis with 1-yd. Koehring paving mixers. Universal truck cranes helped place the concrete in some of the footings, but the deck concrete was lifted to a hopper in 1-yd. buckets by a Thew gasoline crane with a 60-ft. boom. The structure contains about 15,000 cu.yd. of concrete.

Portability and
Flexibility
Prove Useful on
Cleveland Terminal

THE simplicity and mobility of the paving mixer, together with the ease of obtaining delivery of batched material from dealers in the city, convinced the contractors on the majority of extensive concrete structures of the Cleveland Union Terminal development that this plant offered the most economical and convenient means of mixing their concrete. Although no new uses were involved, the number of unusual applications demonstrates the versatility of the paving mixer. All operations are under the direction of H. D. Jouett, chief engineer, and N. H. Suloff, engineer of construction.



DS



CAUSEWAY OVER Shortens Highway

FIVE - TON GASO-LINE TRUCKS haul the material from borrow pits and dump it on the lava flow. Note nature of malpais rock on which causeway is built.

with the Rio Grande Valley which bisects the state from north to south, it became a decided obstacle to the good roads' program of the state.

A survey party went out into the Rio Grande Valley and after nearly a year of toil came to the greatest obstacle, the Great Lava Flow. The crew bought new boots and scrambled across the malpais rocks, as the porous and sharp-cornered volcanic clinkers are called. After wearing out six

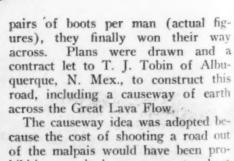
By LADD HAYSTEAD New Mexico State Highway Dept., Santa Fe, New Mexico.

FEW hundred years ago a volcano in central New Mexico spit out a river of lava which flowed about 26 miles in a southerly direction. This Great Lava Flow, as it is called, has long been a point of interest both to tourists and local residents. But when New Mexico started to grow and shorter routes between points became necessary, and as the Great Lava Flow lay parallel



FILLS (above) are kept at high grade line in order to make cuts as small as possible because of difficulty in handling rock.

ROUGH BLADING (right) grade material dumped on lava flow. Uncompleted first dirt line (below) is not laid down to grade, but from cut to cut as a track for trucks.



cause the cost of shooting a road out of the malpais would have been prohibitive, as it is necessary to shoot several times to dislodge a very small yardage of this rock. Moreover, calculation showed that it would be nearly as costly to go around the flow as to



June, 1929-CONSTRUCTION METHODS

Page 54

Ct far I lava take but pebbl no : made are t shoot

the t

track taine

GR pro mac

scra chug

obtai CONST

RIVER OF LAVA

Route in New Mexico

shoot a highway through the malpais.

The method being used is as follows: Huge borrow pits have been made on either side of the lava flow which, at this point, is $3\frac{1}{2}$ miles wide. A gasoline shovel loads 5-yd. trucks which dump on the lava flow. Every few stations there are turnouts for the trucks.

The first rough line of dirt is not laid down to grade but from cut to cut as a track for the trucks. While

THIS POWER SHOVEL (right) needs new vanadium steel teeth every three days for handling the malpais. It is on the job 24 hours a day.





again and quantities calculated from these figures.

The rock from the cuts is hauled away and dumped at the first clear spot, some of it into the many crevasses (often 30 ft. in depth) which cut across the job.

It is believed that the 3½-mile lava stretch and 6 mile of earth grading on either side of the lava will cost less than \$200,000. The bid price was \$186,467. No drainage structures are necessary because of the porous nature of the rock.

ELEVATING
GRADER (above)
proves to be a speedy
machine for shaping up
the grade. A mormon
scraper (right) levels the
worst humps and fills
chugholes after the hand
leveling has been done.

TRACTORS AND TRAILERS (below) are used on part of the job in building fill with material from cuts.

the cut is being shot and grubbed out, the trucks dump dirt along the original track until width and grade are obtained.

Cuts have been made as few and far between as possible, as the broken lava is not easy to handle. It will not take a rock slope but must be grubbed out and hauled away until the last pebble refuses to roll. Accordingly no accurate advance figures can be made on excavation. Cross-sections are taken; then the contractor starts shooting. When a safe slope is at last obtained, cross-sections are taken





DRILLING and grouting were employed to fill the drifts of abandoned coal mines underneath the site of the reservoir.

OR the McNaugher reservoir, in Pittsburgh, the Pitt Construction Co. has completed two reinforced concrete tanks. The larger has a diameter of 185 ft., and a capacity of 5,027,000 gal.; the smaller auxiliary tank has a diameter of 50 ft. and a capacity of 367,000 gal.

The tanks are built on a hilltop and required 30,000 cu.yd. of earth and

ment containing 25,000 cu.yd. was built up on one side of the hill in 3 to 6-in. layers, rolled with a tractor. The area underneath had been mined for coal. approximately 100 holes were drilled and cement grout was forced into the mine passages. The mixing plant for the concrete

To fill drifts and to prevent settling

was erected 40 ft. above the floor of the tank. Short chutes from two 21-S mixers led to a hopper, from which another chute carried the concrete to a second hopper placed above a roadway for trucks within the reservoir.

in Six Lifts With Keyed Joints

The wall of the tank, 28 ft. high, was poured in six monolithic lifts, the keyed joints being sealed with uncrimped copper plates. Lifts varied from 3 ft. to 6 ft. in height, the quantity of concrete varying from a maximum of 248 cu.yd. to a minimum of 176 cu.yd.



TWO CREWS, each equipped with a truck and a crane, placed the concrete in the lifts of the wall.

They started at a point and worked away from each other until they met.

Page 56

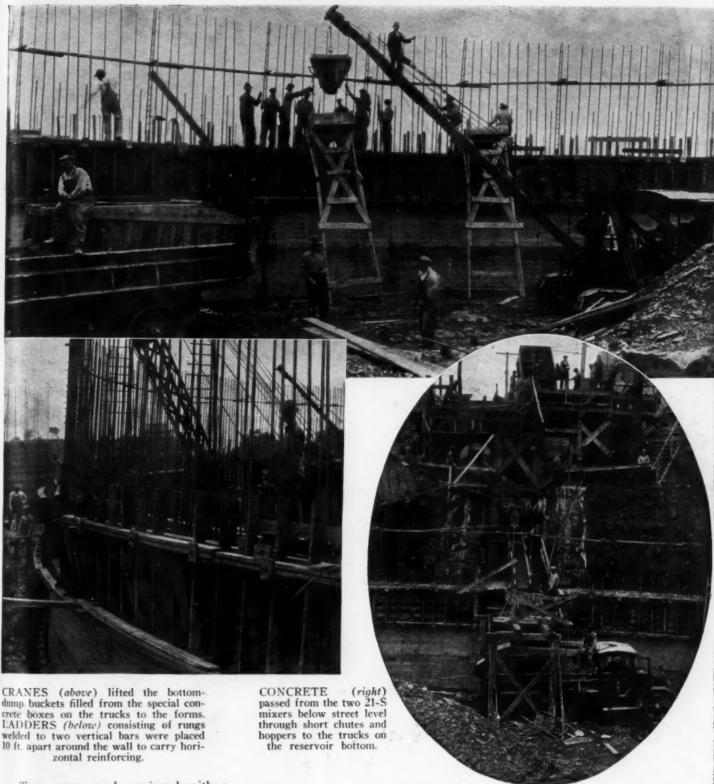
June, 1929-CONSTRUCTION METHODS

dump b crete be LADDI welded 10 ft. ap

Tw truck They around they 1 nated : sulting lavers, other. The

boxes was di bottom a Koel forms. Forn

CONSTRU



Two crews, each equipped with a truck and a crane, placed the concrete. They worked away from each other around the 575-ft. circumference until they met. This arrangement eliminated the annoyance and difficulties resulting when a lift is built up in two layers, with one crew following the other.

The trucks carried special 2-cu.yd. boxes with rear end gates. Concrete was discharged from the boxes into bottom dump buckets which the cranes, a Koehring and a Byers, lifted to the

Forms were built in sections to the

full height of a lift. The wales formed part of the form surface, and the top wale of one lift became the bottom wale of the lift above, the section of sheeting and studs being moved up and bolted on the rods which passed through this wale. Thus the forms were self-aligning.

At intervals of 10 ft. around the wall supporting frames were installed to insure accurate spacing of the horizontal reinforcing bars. The walls were given a coating of Gunite, 1 in. thick, reinforced with wire mesh, and the floor was formed of 3-in. reinforced Gunite shot on to a cushion of sand.

Superintendent J. S. Evans was in charge of all concrete work and J. L. Shipp directed excavation for the contractor. Design and construction of the tanks was under the direction of George L. Hendrickson, designing engineer of the Bureau of Water, with A. M. Cooper, assistant engineer, supervising field operations. Edward G. Lang, director of the Department of Public Works, and Charles M. Reppert, chief engineer exercised general supervision.

Getting Down to DETAILS

Close-up Shots of Job Methods and Equipment

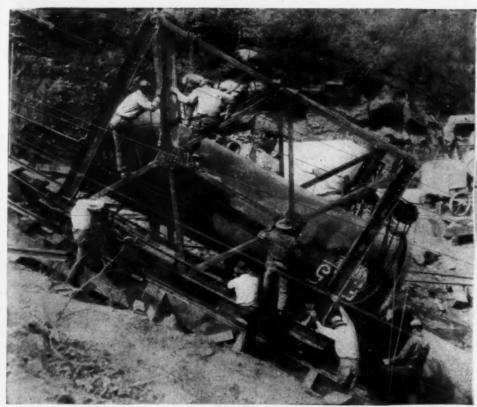
> Haven't YOU a picture of some interesting job detail on your work? Send it along to the Editor.

DONE WITHOUT DIVERS. Cast-iron pipe, with flexible joints, carries 12-in. water main across Chicago Sanitary District canal. From barges Fitzsimons & Connell Dredge & Dock Co. crew, at signal, lowers line to place with block and tackle.

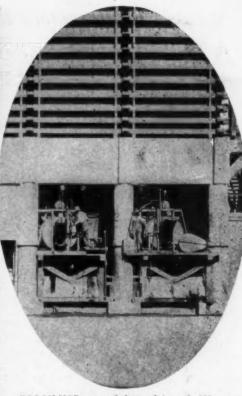
WOOD STAVES form pipe line for Rocky River power development in Connecticut, one of the projects of the U. G. I. Contracting Co., of Philadelphia. Note steel saddles supported by concrete piers and circumferential bands distributed along line ready for use in assembling pipe.

EXTRA WIDTH for this trench is obtained by equipping a Buckeye heavy-duty traction ditcher with a double line of rotary sidecutters. With this powerful rig driven by a 125-hp. gasoline engine, George Zimmerman, Milwaukee contractor, was able to make a cut 11 ft. wide and 20 ft. deep on a sewer construction job.

CONSTR



MOUNTAINSIDE CONSTRUCTION for California Edison Company's Big Creek penstock developed this steel carriage on rails for handling heavy pipe sections 20 ft. long.



COLUMNS at mixing plant of Western Concrete Pipe Co., Los Angeles, are 24-in. Hume pipe sections filled with concrete.



PIPE HANDLING for Bridgeport (Conn.) Hydraulic Co., (S. P. Senior, chief engineer) is simplified by this equipment. (At left) Pipe is loaded on truck by winches driven from power



take-off. (At right) Lever arm with ratchet and rope raises or lowers pipe in two-wheeled trailer. Pipe is 48 in. in diameter and weighs 5 tons per length.



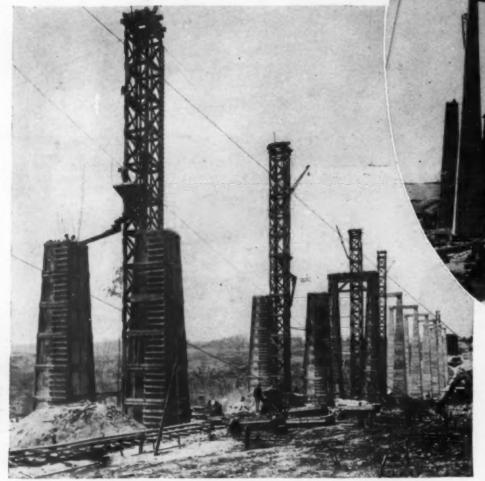
TRANSFERRED from motor-truck to barge, this Universal crane dredges reservoir for Lee Crane Service Co., Boston.

Pontoon bridge carries trucks to receive bucket discharge.

Constructors Resort to
AMPHIBIAN METHODS

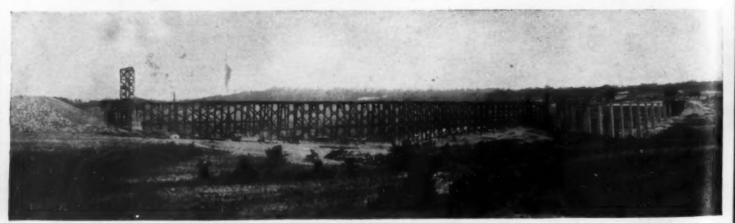
in Building Bridge from Land and Water

> BY JOHN W. PAUL Alabama Power Co., Birmingham, Ala.



CONCRETING UNIT, consisting of two towers, one mixer on wheels and one hoist, poured two trestle bents from one set-up. Tower covered two legs of bent with short spouting section, and hoist and mixer served either bent as needed. Short booms mounted on towers handled the forms and reinforcing steel.

THE building of concrete piers and timber approaches on dry land before filling the Martin Dam reservoir near Birmingham, Ala., and the barging into place one year later of the steel girders and the laying of the roadway after the water had reached maximum height, were the unusual features in the construction of the Kowaliga highway bridge recently built for the Alabama Power Co. by the Dixie Construction Co.



BEFORE RESERVOIR WAS FILLED. Concrete piers and timber approaches for the 2,575-ft. bridge were built on dry land.

Page 60

June, 1929—CONSTRUCTION METHODS

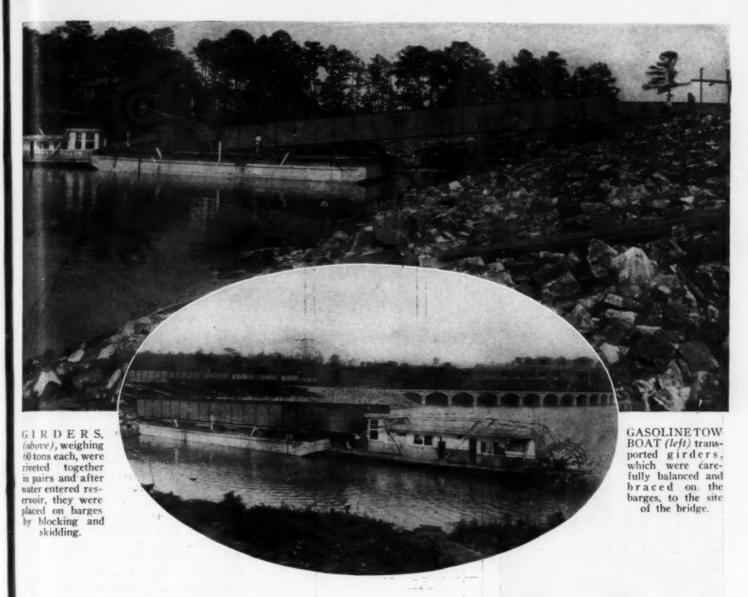
G I R
(above
60 tons
riveted
in pairs
water en
ervoir,
placed
by blo

creoso north cludes creoso vation deep as formir ranged The

The

consis

CONSTRU



The south approach, 862 ft. long, consists of a concrete abutment and 39 creosoted timber trestle bents, and the north approach, 380 ft. long, includes a concrete abutment and 17 creosoted timber trestle bents. Excavation was made at some points as deep as 36 ft. for the ten concrete piers, forming the central portion, which ranged from 55 to 110 ft. high.

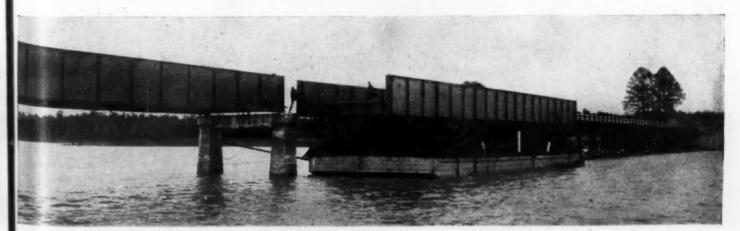
The 60-ton steel girders were shipped

to the downstream side of Martin Dam, about $8\frac{1}{2}$ miles below the bridge, where they were riveted together in pairs and lifted to the top of the dam by a huge gantry crane. After being placed on barges by skillful blocking and skidding, and after being balanced and braced, they were transported to the bridge site by a gasoline tow boat.

As the water was 10 ft. below the top of the piers, the girders were

jacked up and the barges floated into exact position so that when the jacks were released the girders rested in their proper places on the piers.

The bridge, 2,575 ft. in length required 12,310 truck loads of material, exclusive of the girders. It was designed by the contractor's engineers under the supervision of J. J. Yates, consulting engineer, of the Central Railroad of New Jersey.



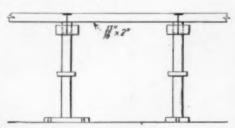
BARGES were floated into exact position so that when jacks were released girders rested in their proper places on the piers.

E. H. DOBSON, the contractor for the substructure and underground pipe.

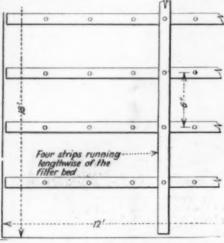
TRUSSED RINGS in place for guid-ing and bracing wood sheet piles in bottom of hole. Pump suspended from braces above.

Sinking a LOW SERVICE PIT

N sinking the low service pump pit of the Sewickley, Pa., filtration plant along the Ohio River, E. H. Dobson. of Avalon, Pa., the contractor



STRAINER PIPES in the filter beds were held plumb by wood strips through which nails were driven into corks in the pipes. This method proved effec-tive and economical.



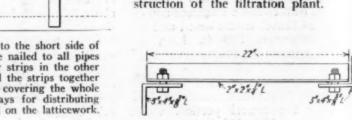
STRIPS parallel to the short side of the filter bed were nailed to all pipes in one row. Four strips in the other direction bound all the strips together into a latticework covering the whole filter bed. Runways for distributing concrete were laid on the latticework.

for the substructure, used the trussed rings shown in the accompanying drawings and photographs to brace the wood sheet piling driven in the bottom .14 ft. of the hole. General basement excavation went to 14 ft, below ground level. The first 16 ft, of the low service pit was driven with 2-in. plank backed by standard wales and braces.

Steel angles, curved and drilled to fit, were assembled and bolted into ring sections on the ground which were lowered into the hole and bolted together in place. Oak plank, 31 in. thick, was driven around the rings, which were spaced 5 ft. apart. This section of the hole was in water-bearing sand.

The method of sinking the pit by two lengths of wood sheet piles, the bottom section being braced with trussed rings, proved not only practical and expeditious, but also saved almost half the cost of driving 40-ft. steel sheet piles. A 2,500-lb. Union hammer, air-driven and hung from the boom of a stiff-leg derrick, drove the piles. The two drawings at the left show the method of keeping the filter piping plumb during concreting.

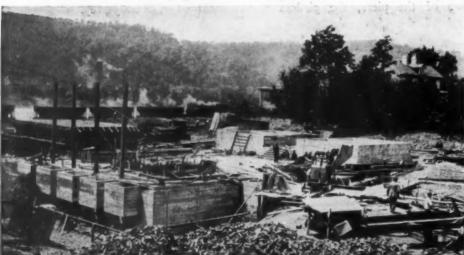
J. N. Chester Engineers, Pittsburgh, are in charge of the design and construction of the filtration plant.





DETAILS of trussed rings which braced the sheeting in the bottom of the low service pit.

June, 1929-CONSTRUCTION METHODS



SUBSTRUCTURE of the Sewickley, Pa., filtration plant along the Ohio River.

East



Aluminum Paint, Sprayed On, Converts Drab Pipe Line Into

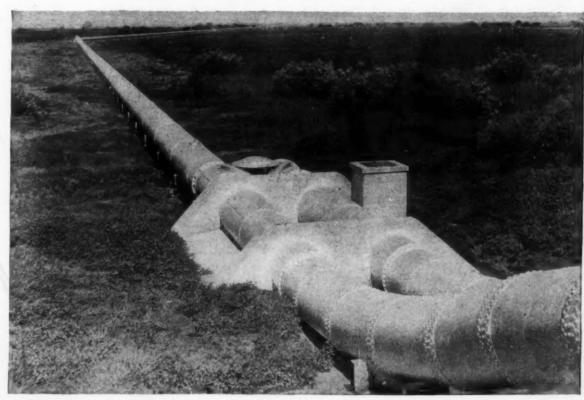
"SILVER" TUBE

AS A measure of protection for the 65-in. diameter steel pipe line of the Mokelumne water supply project for nine California cities, the East Bay Municipal Utility District of Oakland, has applied aluminum paint by the spraying method. The equip-

)11

ve

ment for spray-painting was mounted on a motor truck and included an air compressor driven by a gasoline engine and lengths of hose line leading to the spray nozzles. For convenience in working around the larger pipe, the spray nozzles were mounted at the ends of 6-ft. lengths of pipe, as shown in one of the photographs. The aluminum paint not only protects the pipe line but gives it the appearance of a silver tube stretching through fields of alfalfa along the route of the California district's new water supply system.



TRIO OF DERRICKS

Places 8 Trusses Weighing 500 Tons



dispense with columns in the ballroom of the new St. George Hotel addition in Brooklyn, now under construction, the McClintic-Marshall Co., contractor on the steel work, with

three guy derricks, placed eight huge steel trusses, aggregating almost 500 tons, which span the ballroom and support the weight of the 26 stories that rise above it.

The trusses 76 ft. long and 21 ft. deep, weigh from 55 to 66 tons each. The steel design called for a pair of

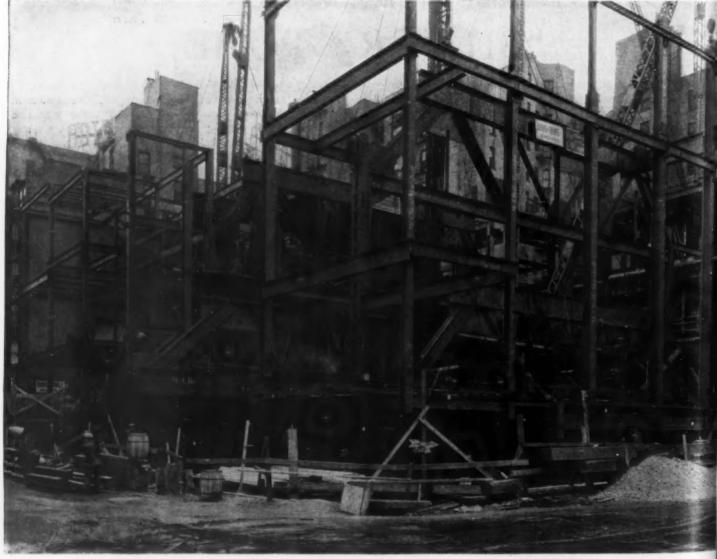
N ORDER to trusses between two columns; in other words, each pair of columns carries two trusses. They were assembled in an upright position adjacent to the columns to which they were to be connected and were riveted in this position. They then were hoisted to place by means of the three guy derricks with 90-ft. masts and 80-ft. booms, two of which were 20-ton capacity, and one of 40-ton capacity. These derricks were so placed that the 40-ton derrick with the aid of either of the 20-ton derricks set the eight trusses. Each 20-ton derrick was powered by a Mundy 80-hp. 2-drum electric hoist and the 40-ton derrick by a Thomas 100-hp. 2-drum electric hoist.

It was impossible to place slings around the top chords of the trusses

when erecting them: Instead hitch angles were fastened to the trusses and after erection the vertical legs were burned flush with the top chords.

With the completion of this addition the St. George Hotel will become the largest hotel in Greater New York, both in ground area and in number of rooms, which will total 2,547. The ballroom, which will be 145 ft. long, 122 ft. wide and 30 ft. high, will be the largest in the city.

Bing & Bing, Inc. is the owner and operator of the hotel and the builder of the addition. Emery Roth is the architect. J. H. Wagner is manager of erection for the New York district for the McClintic-Marshall Co. It is expected that the work will be completed Jan. 1, 1930.



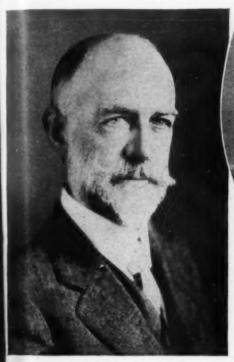
THREE GUY DERRICKS with 90-ft. masts and 80-ft. booms handled the eight steel trusses ranging in weight from 55 to 66 tons.

STRUCT

Present and accounted For -

A Page of Personalities





WILLIAM F. DURAND

Dr. William F. Durand (left) Stanford University, California, Andrew J. Wiley (center), Boise, Idaho and Louis C. Hill (right), Los Angeles, have been named by Secretary Wilbur



ANDREW J. WILEY

Consultants on Boulder Dam

of the Department of the Interior to constitute the board of consulting engineers for the Boulder Canyon dam on the Colorado River. These three engineers will collaborate with Dr. Elwood Mead, Commissioner, and



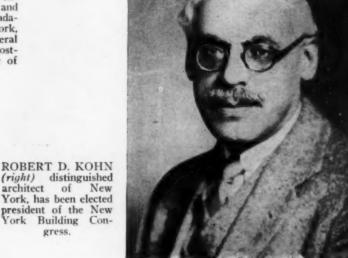
LOUIS C. HILL

Raymond F. Walter, chief engineer, of the U. S. Bureau of Reclamation, who will have charge of the design and construction of the huge water supply and power project.



NSTRUCTION METHODS—June, 1929

CHARLES R. GOW (left) prominent en-gineer of Boston and specialist in foundation and caisson work, has accepted federal appointment as Postmaster of the city of Boston.

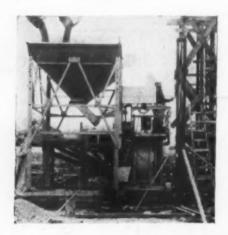


(right) distinguished architect of New York, has been elected president of the New York Building Con-

NEW EQUIPMENT ON THE JOB

Mixer Weighs Own Batches

In response to a desire by contractors for a portable concrete manufacturing plant capable of accurate proportioning of materials by weight, the Koehring Co., of Milwaukee, has developed a new mixer, called the



"Weigh Mix." This unit consists of a standard Koehring mixer equipped with a weighing batch hopper and water tank mounted on an auxiliary frame carrying pipe lever scales. All operations are controlled by one man.

15 and 20-Ton Locomotive Cranes

In order to complete its line of crane equipment, the Thew Shovel Co. of Lorain, Ohio, has added 15 and 20-ton locomotive cranes, designed especially for gasoline, but provided with electric or Diesel power plants if specified. These cranes are equipped with 45 or 50-ft. booms for use with 1 and 1¼-yd. clamshell buckets. The booms

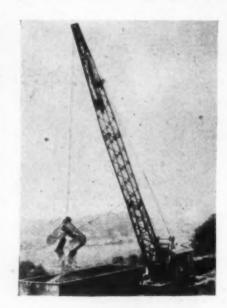


are in two sections with interchangeable boom heads and middle sections for various boom lengths. The 15-ton crane can be transferred readily from car wheel to crawler mounting. Both cranes can be equipped with all standard boom equipment, including the shipper shaft shovel and back-digger booms.

New Line of Cranes

The Link-Belt Co., of Chicago, has placed on the market a new line of locomotive cranes known as the "L" type and especially designed for gasoline engine, Diesel engine or electric motor drive.

These cranes, in five sizes, are furnished with two-speed travel gear—a high speed for traveling light and a



slower speed for pulling heavy loads or making steep grades. The travel speeds do not affect the other speeds of the machine.

Electric Hand Saw

Three sizes of portable electric hand saws, 6, 8 and 10 in. in diameter, are the newest electric tools being manufactured by Black & Decker Manufacturing Co., Towson Heights, Md.



These saws will cut and rip lumber up to $3\frac{1}{2}$ in. thick and may be used with special disks for cutting metal, slate, marble, etc.

Non-Tilting Mixer

A new 14-S non-tilting mixer, said to be unusually simple and fast in operation, is the latest product of the T. L. Smith Co., Milwaukee.

In this new mixer the drum has been improved to permit the use of a



wider-throated skip and a discharge chute of greater capacity, thus assuring quicker loading and discharging. Complete front end operation insures visibility of both charge and discharge sides of the mixer.

Improved Gasoline Shovel

A gasoline shovel with a hoist line speed of 180 ft. per minute; a swing speed of more than 4 r.p.m., and a travel speed of 1½ m.p.h. in high gear and 0.55 m.p.h. in low gear is being featured by the Speeder Machinery



Corporation, Cedar Rapids, Iowa.

Among other improvements are electric lights and starter as standard equipment and a motor with a $4\frac{1}{4}x5\frac{3}{4}$ -in. bore that develops 53 hp.

As a shovel the improved Speeder has for standard equipment an 18-ft. boom, and as a crane either a 30 or 35-ft. boom. The working load is 10,000 lb.

Page 66

June, 1929-CONSTRUCTION METHODS

CONSTR

The Center Drive Extends Working Ranges 10 to 15%

THE Lorain-75 crane will hoist, swing and travel or derrick the boom, all at the same time. This simultaneous operation, due to the Center Drive design, often extends working ranges 10 to 15%.

The Crane will work up and down the stockpile just like a locomotive crane with the added mobility of a 2-speed Center Drive crawler mounting.

THE THEW SHOVEL CO.

Lorain, Ohio

Shovels · Cranes · Draglines · Backdiggers Locomotive Cranes

Gasoline, Diesel, Electric and Steam Power

THE CENTER ORIVE

A Center Drive shovel boom with capacity to handle a 1¼ yard dipper is interchangeable with the crane boom.

Making a Wheelbarrow Profit?



A WHEELBARROW profit—that's what you're making if you're still using teams and wagons for dirt moving. Don't take our word for it or anyone else's word against it. Let the agile "Iron Mule" prove its own profit making possibilities right on the job.

Scores of contractors who have tried out the "Iron Mule" now have fleets that vary in size from 4 to 60 units. Actual trial on the job proved that there isn't any equipment yet manufactured that could approach "Iron Mules" for short-haul dirt moving.

In all these demonstrations animals and wagons proved their out-of-dateness and trucks just couldn't short-haul at anywhere near "Iron Mule" speed.

"Iron Mules" assure dirt moving contractors of exceptionally powerful yet nimble tractor

Tear Out Coupon

HUGHES-KEENAN COMP Manafield, Ohio	PANY,
Gentlemen: Please send without obligations and dump body literature.	on your free illustrated "Iron Mule" broad-
Name	
Address	
City	State



dumps—a 2 yard or 4 yard dump body mounted on a McCormick-Deering Industrial Tractor, Model 20, You'll find "Iron Mules" amazingly adaptable. They are easily and quickly spotted for loading or dumping. In soft earth, mud or on the roughest ground they're right at home—broad of traction, soft stepping, tenacious. They keep going ahead in conditions no contractor would dare risk a truck.

Mail the coupon below for illustrated broadside. Know "Iron Mules"—both the 4 yard with power hoist dump and crawler tracks, and the 2 yard with gravity dump and specially designed heavy duty French and Hecht wheels.

Wherever big profit is made in dirt moving, you'll find "Iron Mules" on the job. They're the best bet in any weather, under any conditions. And Hughes-Keenan Dump bodies for all makes of light trucks out-last a couple of chassis.

The 2 yard "Iron Mule" in action



The Hughes-Keenan Co. Mansfield, Ohio

IRON® MULE

TRACTOR DUMP



"Our Ransome Paver has already gone through five seasons of hard work with practically no shut-downs for repairs."

"I would estimate that it annually delivers over 11,000 cu. yds. of concrete. In its fourth year it delivered over 16,000 cu. yds. The travel estimate on its own power and crawlers is upwards of 25 miles annually."

"I feel justified in estimating it good at least for three more seasons' work."

FRANK B. BOSCH, Central Construction Corporation, Harrisburg, Pa.

The Master Paver Book tells the whole story about the Ransome 27-E Paver.

Send for your copy today.

PAVERS 27-8,13-8,10-8

Ransome Concrete Machinery Company

Dunellen

New Jersey



DOUBLES the Earning Power of the Tractor

The addition of the hoist unit in no way interferes with regular drawbar work.

Single and Double Drum TWO SPEEDS

CABLE CAPACITIES: Main Drum

800 ft. of ½ in. Line 600 ft. of ¼ in. Line Upper or Haulback Drum: 900 ft. of 3/8 in. Line 600 ft. of 1/2 in. Line

LINE SPEEDS

LINE PULL

Low Gear.....6600 lbs. Bare Drum High Gear.....3500 lbs. Bare Drum

Selling Agents: ALL AUTHORIZED "CATERPILLAR" DEALERS

WILLAMETTE-ERSTED Hoists, standard for the "Caterpillar," have worked side by side with the "Caterpillar" THIRTY and SIXTY to make industrial history throughout the world Now comes a hoist for the "Caterpillar" TWENTY to further the fame of this rugged combination.

SOME OF ITS MANY FIELDS OF SERVICE:

Pile Driving, Dragline Operations, Excavating, Grading, Land Clearing and Stump Pulling
Logging, Steel Erection, Hoisting Building Materials,
Sand and Gravel Pit Work

Write us for details or ask your "Caterpillar" Dealer

AUTOMOTIVE HOISTS Tractor or Stationary LUMBER CARRIERS

PORTLAND, OREGON, U. S. A.

AUTOMOTIVE CRANES WILLAMETTE **FAIRLEAD** LOGGING ARCHES

T

su

IS &

Sales

Ho

CONS



bulldozer and tons of earth go tumbling into the trench. Back a little—a sharp turn—up again to the wall of earth. There's a kick in the job for the man who sits in the seat of a "Caterpillar". Quick to turn in close quarters, sure-footed where ground is soft or hills are steep—sure-steering—powerful. Wherever there is a job to be done—a load to be hauled, you will find "Caterpillar" Tractors doing

Caterpillar Tractor Co.
EXECUTIVE OFFICES: SAN LEANDRO, CALIFORNIA

it better, quicker, cheaper.

Sales Offices: Peoria, Illinois - 50 Church St., New York - San Leandro, Calif. Holt Combined Harvesters - Russell Road Machinery "Caterpillar" Tractors



 Prices—f. o. b. Peoria, Illinois

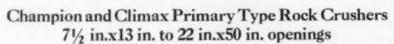
 TEN \$1125
 TWENTY \$1975

 FIFTEEN \$1500
 THIRTY \$2475

 SIXTY \$4300

The Good Roads Machinery Co. Inc.

"A business established and in continuous operation for Afty-one years at Kennett Square—in Pennsylvania."

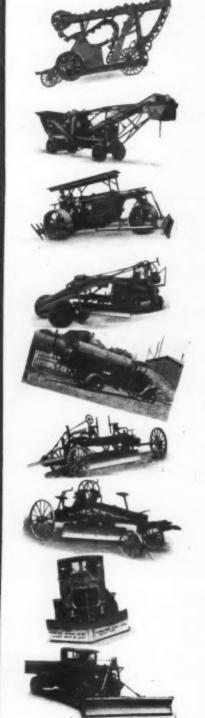


Champion Roller Bearing Reduction Crushers

Elevating—Conveying—Screening—Feeding and Washing Equipment

Complete plants designed and installed for the Rock Products, and Sand and Gravel Industries

> Portable Rock Crushing and Gravel Plants





The Good Roads "AUTOGRADER"
RED SEAL CONTINENTAL MOTOR. Many important features

Motorized Road Graders
The "Autograder"
The "Motograder"

Chip Spreaders—Road Rollers

Champion Bituminous (Heater Type)
Distributor Equipment

Cold Application Oil Distributors

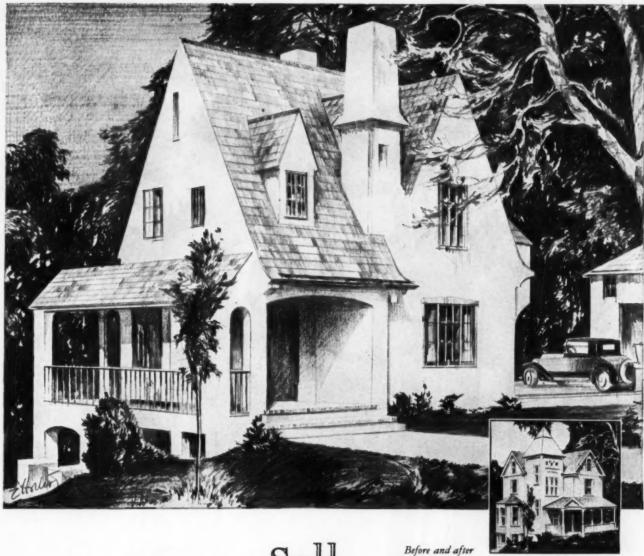
Champion Snow Removal Equipment for Motor Trucks Sand Spreaders

SALES BRANCHES

PHILADELPHIA PITTSBURGH WATERTOWN, MASS.

New York

ITIES MACHINE



new houses for old

How many homes are there near you like the one illustrated above? It was just a sad relic of the gay nineties. No one wanted it at any price. Then it was modernized. The exterior was transformed with stucco made with Atlas White Portland Cement. And immediately it was sold for \$13,500. The owner, the contractor, and the building material dealer, all made a good profit; the buyer made a good purchase.

There probably are many similar remodeling opportunities in your locality. Why not investigate and see what interest

remodeling an old frame bouse at Norwalk, Conn. Harry Stacy Benton, Architect & Owner.

you can create among owners of out of date homes and new jobs for yourself?

Business buildings offer equally great possibilities for modernizing contracts. You can point out to owners that they can increase rentals by stuccoing store fronts, putting in new pavements, or, where needed, remodeling the entire building.

Atlas may help you in this field. Talk to your building material dealer. Find out about the helps which Atlas has prepared to secure modernizing jobs. If you would be interested in starting a little advertising campaign of

> your own, sending letters and folders to certain property owners, you will find the dealer ready to cooperate with you.



THE ATLAS PORTLAND CEMENT COMPANY, MAIN OFFICES: NEW YORK, ST. LOUIS

BOSTON · ALBANY · PHILADELPHIA · CHICAGO · DES MOINES OMAHA · KANSAS CITY · OKLAHOMA CITY · WACO · BIRMINGHAM



Portable

One man—one hand carry weighs only 75 lbs. complete

> with built-in air cooled gasoline engine



Self Priming

Has no foot valve and needs none



for Volume

Pumps up to 6000 gallons per hour



Pumps as long as there is water in the hole





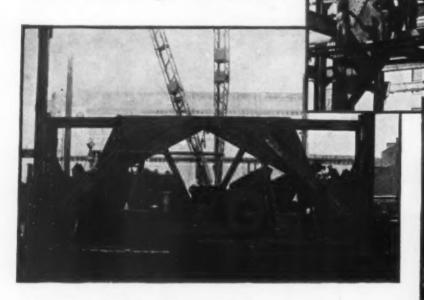
A convenience in Sould for demonstration and service

HED VER ELETED

Portable Self-Priming Centrifugal Pump

Hamilto Compession 75 Piverdale Ave Part Chester, N. Y.

Carnegie Beams solve a difficult problem



The marble columns of the Union Gas and Electric Company Building in Cincinnati (John Russell Pope and Garber & Woodward, Associate Architects-Euphrat & Hanly, Steel Designers) presented a difficult problem in steel designing, in that the outside dimensions of the finished columns limited the size of the section that could be used for the steel cores. The photograph on the right shows how Carnegie Beams solved the problem with complete satisfaction. Section CB 146, weighing 345 pounds per foot, was used as a column, reinforced internally with two 11 x 1" plates riveted to the web and four 6 x 6 x 1" angles riveted to the web and inside faces of the flanges. This type of reinforcement was made possible by the parallel flanges of Carnegie Beams, a unique feature of these sections. Eight surfaces are provided for connections instead of four.

The upper photographs show two heavy trusses for the same building. In these the top chord, the end diagonals, and in the case of the larger truss, the posts were all Carnegie Beams of the same section as the columns. Note also Carnegie Beams used as web members and the simplicity of the gusset plate construction.

Similar designs may be developed utilizing the constant depth feature of the 10" and 12" column sections of Carnegie Beams. A large range of weights is available in each depth, providing sections to meet the varying stresses in the truss members. Trusses are also designed in which the web members of less depth connect internally to the parallel flanges of the chords.

Carnegie Beams offer an economy, utility and flexibility of design never before possible in structural steel. Write for copy of handbook—"Carnegie Beam Sections".

1977

CARNEGIE STEEL COMPANY



CARNEGIE BUILDING PITTSBURGH, PA.
Subsidiary of United States Steel Corporation





"Northern"

More Material at Less Cost Units and teams for any use or capacity



SPEEDY DURABLE



Universal Belt Conveyor Complete \$450.00

Another Universal Conveyor Note Swivel Wheels

THE NEW UNIVERSAL GRAVEL CAR UNLOADER

Operates without ANY pit

Loads onto ANY conveyor

Conveyor may work at any angle

Handles all loose material

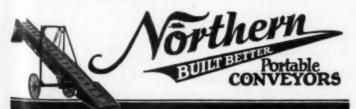
Exceptionally low priced

Large volume CLEAN and SURE



CAR UNLOADER AND KING CONVEYOR FOR UNLOADING CAR IN 45 MINUTES

TERMS AND OUR 5 YEAR GUARANTEE



NORTHERN	CONVEYOR	80	MFG.	CO.,
Ianesville, Wis	consin			

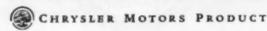
Send catalog of Northern Conveyors

and Car Unloaders.

Name

City

Dode Brothers Trucks





For your greater profit-put Dodge Trucks to work

WORK is the sole function of any motor truck as profit is the ultimate aim of any business. Work—its quality, its quantity, its cost—must be the true measure of motor truck value.

From drawing board through to factory gate the experienced brains and skilled hands of the builders of Dodge Trucks are guided by consideration of the work each truck must do for an owner. And world-wide Dodge service is ready, always, to keep them at work.

Hundreds of thousands of Dodge Brothers Trucks are in use by owners who prefer Dodge Trucks. Repeated purchases prove this preference. Each appraises work in his own way—yards hauled, miles run, power, speed, economy, reliability, freedom from layup. For your

greater profit—whatever your trucking needs—put Dodge Trucks to work for you.

PRICES

MERCHANTS EXPRESS-	-10	9'	w.	Ь.		\$ 545
COMMERCIAL TRUCK-						
1-TON-130' wheelbase		0	0			995
1-TON-140' wheelbase		0	0	٥	0	1065
11/2-TON-150' wheelbase		0			0	1345
11/2-TON-165 wheelbase			0		0	1415
2-TON-150' wheelbase						1515
2-TON-165' wheelbase	6			0		1585
3-TON-135' wheelbase		0		0	0	1745
3-TON-165 wheelbase						1775
3-TON-185' wheelbase					0	1845
Chassis f. o. b.	D	etro	oit			

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE

THE RIGHT TOOL SAVES TIME

FOR HANDLING HOT MATERIALS

This asphalt rake is designed to withstand the severe service of asphalt paving work. Its long shank prevents the handle from burning.

Made in both straight and drop shank patterns. The drop shank pattern is very useful for leveling off asphalt before rolling. Tool shown has 14 teeth. Head is 4½" deep and 16¾" wide. Selected ash handle 5 feet

long, with strap ferrule.
The brand True Temper is burned in the handle to mark each rake as the best tool of its kind that can be made.

THE AMERICAN FORK & HOE CO.

1901 Keith Bldg., CLEVELAND, OHIO

Makers of Farm and Garden Tools for over 100 Years

If your dealer has not yet stocked the Asphalt Rake, Cat. No. 1014, send us his name and \$2.60 and we will supply you direct, postpaid.



Branded on

the handle of

every genuine

TRUE

EMPER

tool

FREE On Request

Heavy Steel Goods or Industrial Tool Catalog. Describes over 50 tools for mill, mine, factory and coal yard.

ASPHALT RAKE





DIETZ NO.2 BLIZZARD THE VETERAN HIGH GLOBE COLD BLAST LANTERN

THE bright red glow of Dietz Lanterns along the roadside insures the fullest measure of protection at lowest possible cost.

Dietz Lanterns shout "Danger" in every language. Everybody knows what they are and what they mean.



danger

Use

The Lantern illustrated, Dietz No. 2 Blizzard, meets requirements when the preference is for high grade lanterns of large size and maximum lighting power. Made also with extra large oil fount.

R. E. DIETZ COMPANY

NEW YORK

Largest Makers of Lanterns in the World FOUNDED 1840

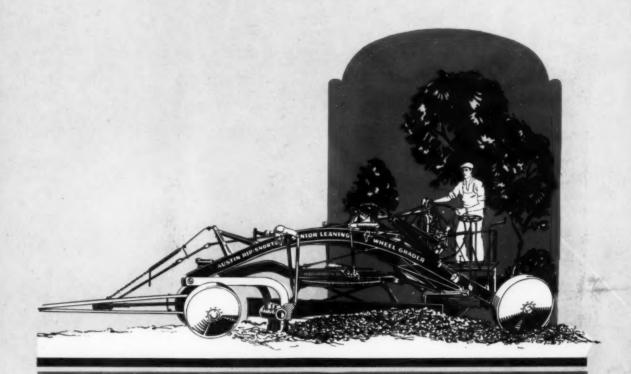


An ALL PURPOSE Machine



Universal Power Shovel Company

Division of Unit Corporation of America 15841 Second Boulevard DETROIT, MICH.



Simplified methods bring better work and lower costs

Doing a better job in a single operation on work that previously took two or three operations spells progress in highway construction and maintenance.

Austin-Western achievements are outstanding because of this constant effort to widen the range of usefulness of road building and maintenance equipment. Ma-

chines always greedy for more work to do

will not do "half-way" jobs.

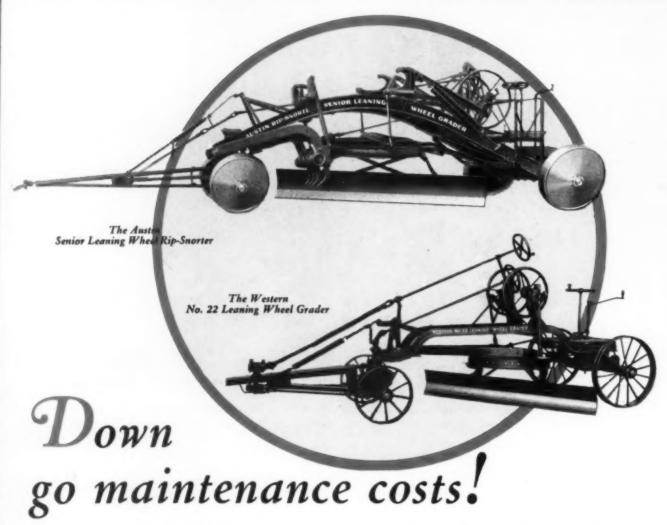
Not only is Austin-Western Road Machinery capable of taking on a wider variety of tasks than the average — but it is so designed that it meets the full requirements of any work for which it is recommended—assuring you most miles for your road dollars.

Austin-Western ROAD MACHINERY

THE NEW



DUAL DRIVE



Austin Rip-Snorters

Rip-Snorters are combined grader-scarifiers which will tear up and regrade in one operation old, wornout roads or rough subgrades. Formerly such work involved several slow and expensive operations.

Both Senior and Junior Rip-Snorters are made in either straight or leaning wheel models—ranging in weight from 11,200 lbs. to 5,300 lbs. The Senior Leaning Wheel model is equipped with disc wheels to facilitate leaning the wheels. All other models are regularly equipped with spoked wheels.

The Western No. 22 Leaning Wheel Grader

This strong, sturdy patrol grader can be used for light grading and ditching. Leaning wheels and an adjustment for side shifting the frame on the rear axle make this a very efficient machine for all-around work.

Regularly fitted with plain bearings and removable axle sleeves—Timken Roller Bearings are available and recommended for work on gravel roads. Regularly weighs 2,300 lbs. with 8 ft. blade.

Write for full information on these machines

THE AUSTIN-WESTERN ROAD MACHINERY CO.

400 North Michigan Avenue, CHICAGO, ILLINOIS-Branches in principal cities

Leaning Wheel Graders, Straight Wheel Graders, Motor Graders, Elevating Graders, Crawler Dump Wagons, Scarifiers, Rock Crushers, Portable Conveyors, Rollers, Motor Sweepers, Street Sweepers, Sprinklers, Road Oilers, Hot Patch Portable Asphalt Plants, Plows and Scrapers



Where There's Work to Be Done CLETRAC Does It Profitably!

BIG loads—heavy pulling in mud and mire—narrow trails—steep grades—it makes little difference what the conditions are or how difficult the work when there's a Cletrac on the job. Here is power, sure and dependable for every power operation—ready to serve you profitably every day in the year.

If you do not know the notable work of CLETRAC Crawler Tractors—their remarkable ability to cut costs and speed up work on all road operations and contract jobs—mail the coupon or write, today, for the complete story.





Cletrac Offers a Complete Line from Which to Choose

There is a Cletrac model to economically fit every job—a size to meet every power need from the small jobs up to the very biggest. Cletracs are built in a complete line ranging from 12 horse-power to 100 horse-power.

The Cleveland Tractor Co., 19323 Euclid Ave., Cleveland, O Send full details of Cletrac for industrial work.

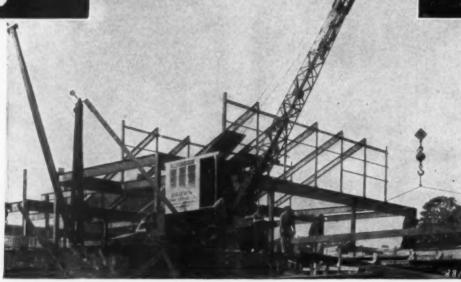
Name

Address



A Browning Truck Crane erecting steelwork on the new post office building in Orange, N. J.





A Browning Truck Crane will lop hours off your handling time-both getting to the job and getting the job done. It is as mobile as a truck and does the work of a dozen men. You will get more productive work done with a Browning-the facts prove it. Let us tell you all about them.

The Browning Crane Co., 16226 Waterloo Rd., Cleveland, Ohio, U.S.A. Branch Offices: New York, N.Y., Chicago, Ill.

DISTRIBUTORS

Portland Toronto Detroit

Los Angeles New Orleans Albany Buffalo Boston San Francisco St. Louis

Chicago Birmingham Minneapolis Montreal Syracuse Philadelphia

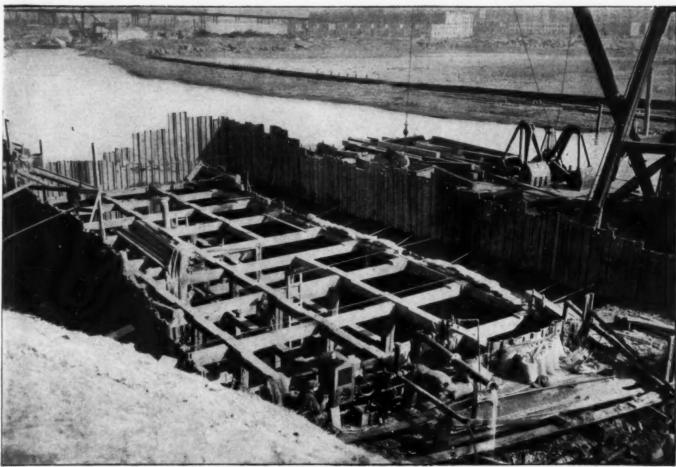
ROWN



LOCOMOTIVE, TRUCK, and CRAWLER CRANES



CONS



E. O. Roberts Company, Inc.

One of the big New York City-Contractors. LACKAWANNA STEEL SHEET PILING Cofferdams for piers of Ludlow Avenue Bridge, New York City

Lackawanna 14" x 3/8" Arched-Web Steel Sheet Piling was used in the construction of these Cofferdams. The pier which was constructed in the Cofferdam illustrated was 93'-0" x 40'-0" and was founded on rock, 21'-0" below high water.

After the Cofferdams were unwatered, the double wall of Lackawanna Pil-

ing, with fill between walls, provided watertight Cofferdams, permitting piers to be constructed in the dry.

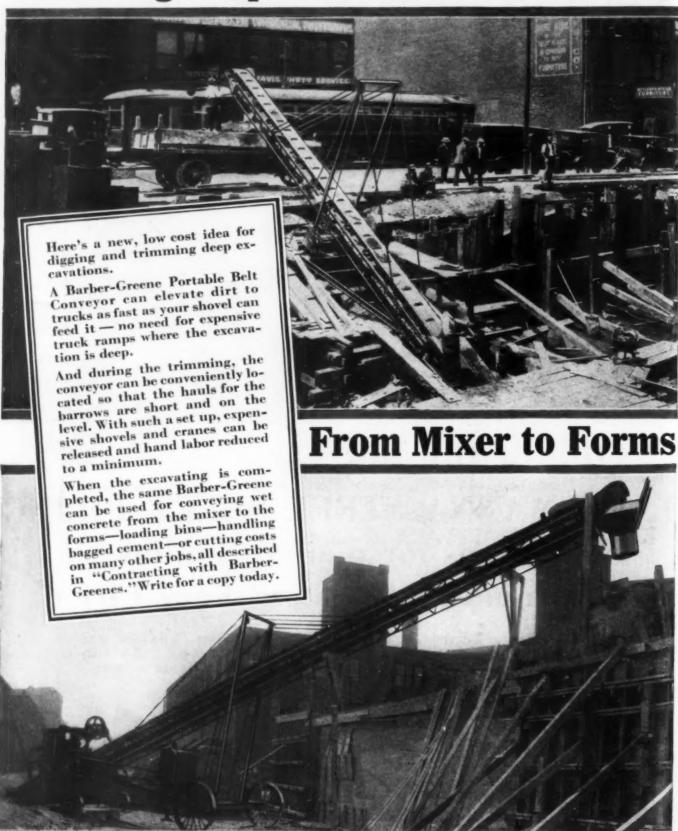
There are other Lackawanna Sections -Straight - Web, Arched - Web and Deep-Arch—to serve your particular purposes. Write to our nearest District Office for literature describing these Sections.

BETHLEHEM STEEL COMPANY :: General Offices: BETHLEHEM, PA.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, Portland, and Honolulu. Bethlehem Steel Export Corporation. 25 Broadway, New York City Sole Exporter of our Commercial Products

BETHLEHEM

Trimming Deep Excavations-Profitably



Car Unloaders Coal Loaders Portable Conveyors

BARBER

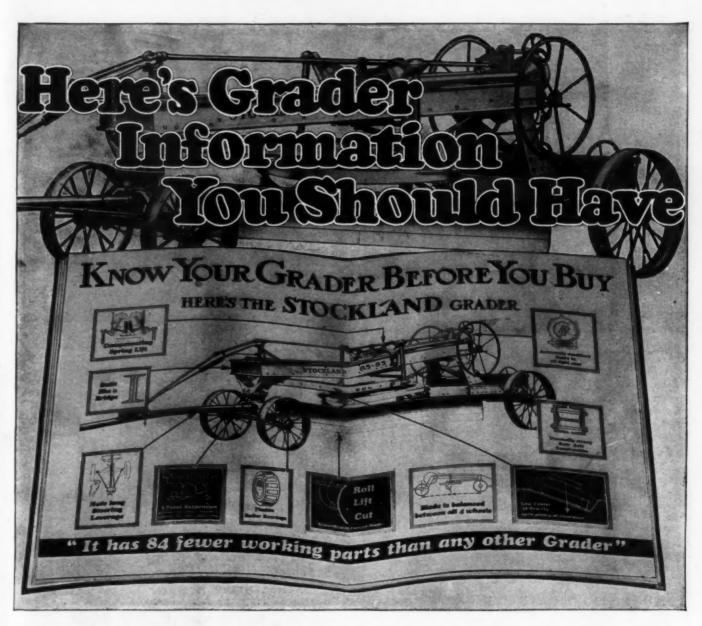
BARBER-GREENE COMPANY



GREENE

Ditchers Loaders Permanent Conveyors

530 W. Park Avenue, Aurora, Illinois



Send the Coupon for Complete Information and Data on-

STOCKLAND Graders

Among the many points of Stockland superiority in this book you will find illustrated the famous curved blade—low center of gravity with plenty of clearance—three-point suspension, etc., which insures long life—less depreciation—lower operating costs, and results in the Stockland iron-clad guarantee "to move more dirt at less cost."

GEAR & MACHINE CO. Road Machinery Division 111 N. Canal St., Chicago

Sales and Engineering Offices in all Principal Cities, U. S. A. and Canada

MODELS

"80-12" "30" "Whippet"
"50-10" "20" "Greyhound"
"35-8"

STORTE

FOOTE BROS. GEAR & MACHINE CO.

111 N. Canal St., CHICAGO, ILL.

Please send me copy of The Stockland Grader Book.

Signed



Get a sample Quick-As-Wink Hose Coupling, put it in use and watch the results. These couplings speed every job on which they are applied. They make your hose give its full life's service. They prevent interruptions, eliminate delays and promote efficiency.

Give it the Toughest Test You Can Find on the Job

Connected or disconnected in one second, but can not come apart accidentally. They work perfectly, even when covered with mud or ice. They can't be put out of commission. No delicate parts to break nor get out of order.

Tight Joints that Swivel But Can't Leak

Quick-As-Wink Couplings make perfectly tight joints, but they have a free swiveling action that prevents hose kinks, eliminates hose ruptures and allows a steady, uninterrupted flow of air or water. Hose sections quickly disconnected when shorter lengths are desirable for securing greater water-pressure or for moving or storage.

Lasts 4 Times As Long As Any Other Coupling Made

Made to last—to stand up against hard, banging use. They will give a service equal to four times the life of ordinary couplings.

WRITE TODAY!

Write immediately for descriptive bulletin, prices and sample on approval to your nearest jobber listed below or direct to us.

John Simmons Co., 102 Centre St., New York, N. Y.
H. Channon & Co., Randolph and Wacker Drive, Chicago, Ill.
E. P. Sanderson Co., P. O. Box 5321, Boston, Mass.
The Rayl Co., 228 Congress St., West, Detroit, Mich.
Cleveland Tool & Sup. Co., W. 6th St., Cleveland, Ohio.
Syracuse Supply Co., 314 Fayette St., Syracuse, N. Y.
Beals, McCarthy & Rogers, 60 Terrace, Buffalo, N. Y.
Haverstick & Co., 45 Ford St., Rochester, N. Y.
Sager & Spuck Supply Co., Albany, N. Y.
Harris Pump & Supply Co., 318 2nd Ave., Pittsburgh, Pa.
Rancher Mfg., Co., (Pacific Coast Distributor), Pomona,
Calif.

C. B. HUNT & SON

637 McKinley Ave., Dept. A, Salem, Ohio



For Bridge Work

For those one-hand wrench jobs, Lowell Steel Socket Bridge Wrenches do the work easily and quickly.

With a Lowell you can turn nuts on or off without removing the wrench -and turn the trick with one hand. And what a difference there is between the speedy pumping of a Lowell and the more laborious way of refitting after every turn. The first fitting is the last. No time lost getting the wrench back on the nut. May we send you complete catalog R? special wrenches for special needs.

LOWELL WRENCH CO. Worcester, Mass.





CONSTR

3

K(O) E H

THEN you're up against tough, hard digging-when you have to pry and push, you want the dipper to go where you want it to go, and not to dodge about of its own accord in the line of least resistance.

Koehring Independent crowd and independent hoist gives you complete absolute control - and you can put the full power either behind crowd or hoist!

—and if the dipper does hit a boulder on the swing - the Koehring shock absorber at the boom foot cushions the side shocks and strains! Know the Koehring.

Here's Where You Want Independent Crowd and Hoist and the **Koehring Shock** Absorber

Shovel Capacities

Line of plate struck measure, Shock absorber on boom, Quickly convertible to pull shovel, crane or dragline.

or dragline.

No. 301 - 3/4 yd. dipper on 16'
stick, standard. Other dippers on
proportionate stick lengths.
Wisconsin 4 cylinder gasoline
engine 5/4"x6/½", 1000 R. P. M.

No. 501 - 1/4 yd. dipper on 16'
stick, standard. Other dippers on
proportionate stick lengths.
Wisconsin 4 cylinder gasoline
engine, 6"x7", 1030 R. P. M.

No. 601 - 11/4 yd. dipper on 16'
stick, standard. Other dippers on
proportionate stick lengths.
Wisconsin 6 cylinder gasoline
engine, 6"x7", 760 R. P. M.

Write for Koehring Shovel Bulletin

KOEHRING COMPANY MILWAUKEE,
PAVERS, MIXERS—GASOLINE SHOVELS, PULL SHOVELS, CRANES AND DRAGLINES
Sales Offices and Service Warehouses in all principal cities

Foreign Department, Room 579, 50 Church Street, New York City

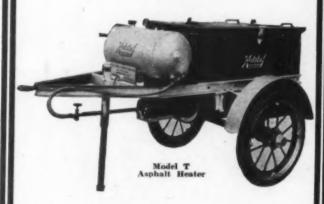
Division of National Equipment Corporation A5192-1



ASPHALT HEATER

with Patented Elevated Melting Chamber

produces 30 per cent to 50 per cent
GREATER MELTING EFFICIENCY
and ECONOMY



The Hotstuf Asphalt Heater is especially adapted for road contractors, state highway and city street departments. This heater has approximately double the melting capacity of the old style wood burning kettle, and eliminates the smoke nuisance and fire hazard.

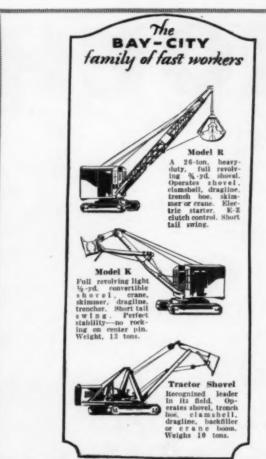
The No. 50 Heater mounted on wheels is especially suitable for patrol work, patching, filling cracks, and resurfacing, and is very economical and convenient to operate.

The Model-C Combination Paving Tool and Asphalt Heater will produce Hot Tools and Hot Asphalt in 5 minutes. Saving approximately \$10 per day over old style fire wagon.



MOHAWK ASPHALT HEATER CO., Schenectady, N. Y.
Please tell me more about the Hotstuf Asphalt Henter.
Name

I am a Contractor | I am a Distributor |



BAY CITY SHOVELS, Inc., Bay City, Mich.



No Place Too Cramped for Watson-Stillman Independent Pump Jacks

They are being used extensively by Underpinning and Foundation Contractors for underpinning work, sinking piles under foundations and making tests of footings.

We make a full line of other types of jacks, and also many hydraulic devices suitable to the contractor's needs, such as concrete testing presses, benders, shears, pumps, punches, valves, tunneling shields, etc.

Write for Catalogs

THE WATSON-STILLMAN CO. 1014 Evening Post Bldg., New York City

Chicago Philadelphia Pittsburgh Richmond St. Louis Cleveland Detroit

CONSTRI

Shoveling a Roadway Through Miles of Blasted Rock



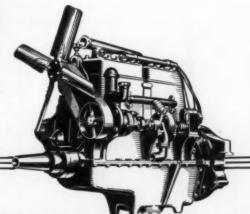
CUTTING a highway through a boulderlittered hillside at Columbia, Alabama, a Hercules Powered Byers Master easily accomplished the severest tasks that could be required of a power shovel.

On tough excavation jobs Hercules powered gas shovels invariably make good. Shovel operators and manufacturers give credit to Hercules Engines for many records of outstanding performance.

Hercules Engines are available for all types of construction and road maintenance equipment, as well as for shovels up to 1-1/4 yard capacity, either in four or six cylinder models. Write for complete information.

HERCULES MOTORS CORPORATION CANTON, OHIO, U.S.A.

West Coast Branch : Los Angeles, Cal.



HERCULES ENGINES

Lower drainage costs with Dependable Barnes Pumps



Model L-303 Duplex Diaphragm

The Barnes Model L-303 Duplex Diaphragm illustrated above is popular with experienced contractors because of of its large capacity, and its ability to handle mud and sand as well as water.

Barnes Centrifugal units are supplied in twelve sizes with capacities up to 150,000 G.P.H. and are recommended where extremely large volumes of water are to be handled.

Public service companies and municipalities use the Barnes Model F-305, Lift and Force Diaphragm Pump illustrated below, for its efficiency in pumping out conduits, manholes, etc., in connection with sewer and trench construction.

Barnes Pumps are mechanically sound and built for years of hard service. There is one which will meet your requirements. Mail the coupon below for complete information.

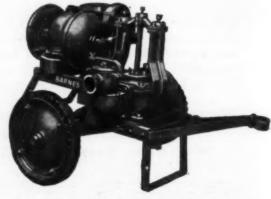
THE BARNES MANUFACTURING CO. 923 Main St. Mansfield, Ohio

Please	se	nd		m	e	c	01	m	pl	le	te	e	i	n	fo	n	te	18	ŧi	0	n	1	nl	00	N	t	B	ai	re	e	5	-	P	18.0	m	p
or					. ,		,										4								,											
Name .							*				×												* 1								,					
Addres	8		,																							,										

Lower Drainage costs almost invariably follow the installation of a a sturdy Barnes Drainage Pump. Contractors, municipal officials, public service companies and others to whom drainage costs are an important item purchase Barnes pumps for the freedom from trouble and economical, efficient operation they give.



Model 703 Centrifugal Unit



F-305 Lift and Force Diaphragm Pump



See that Hammer go down under the water!

A McKiernan-Terry 10-B-2 was used by P. T. Cox Contracting Co., driving 1400 bearing piles for the Greenpoint Ave. Bridge across Newtown Creek between Brooklyn and Long Island City.

Piles 30 ft. to 35 ft. long, driven to full penetration in creek bottom - hammer completely submerging no loss of driving efficiency. Average per day 73—greatest day's work 104 piles. Hammer hung from barge telescopic leads.

Yes sir — we were the first to start this "submarine" pile driving business, saving immense totals in dollars, hours, labor. Most notable pile driving improvements were McKiernan-Terry. A hammer for every purpose. Write for Catalog.

McKIERNAN-TERRY DRILL COMPANY 13 Park Row, New York

Pile Hammers and Accessories, Drilling Machinery

Works at Dover, N. J.

E. R. BACON CO.
San Francisco, Calif.
J. W. BARTHOLOW CO.
Dallas—Fort Worth, Tex.
BECKWITH MACHINERY CO.
Pittsburgh, Pa.
J. P. BENJAMIN
Jacksonville, Florida
BORCHERT-INGERSOLL, INC.
St. Paul—Duluth, Minn.
BRANDEIS MACHINERY &
SUPPLY CO.
Louisville, Ky.
CAROLINA CONTR. EQUIP. &
SUPPLY CO.
Columbia, S. C.
CLYDE EQUIPMENT CO.
Seattle, Wash.—Portland, Ore.
THE DAY & MADDOCK CO.
Cleveland, Ohio
D. C. ELPHINSTONE, INC.
Baitimore, Md.

Works at Dover, N. J.
R. B. EVERETT & CO.
Houston, Tex.
FUNKHOUSER EQUIPMENT CO.
Kannas City, Mo.—Oklahoma
City, Mo.—Oklahoma
City, Mo.—Oklahoma
City, Mo.—Oklahoma
City, Mo.—Oklahoma
City, Mo.—Oklahoma
City, Okla.
Bortone, B. L.—New Haven,
Conn.
Conn.—Springfield, Mass.
Providence, B. L.—New Haven,
Conn.
Conn.—New Harden, Mass.
Providence, B. L.—New Haven,
Conn.
Columbia, Mo.
TURNER SUPPLY CO.
Chicago, Ill.
MoNIELLY MACHINERY CO.
Chicago, Ill.
MoNIELLY MACHINERY CO.
Columbus, Ohio
D. C. ELPHINSTONE, INC.
Baitimore, Md.

Works at Dover, N. J.
R. B. EVERETT & CO.
Houston, Tex.
Bichmond, Va.
Richmond, Va.
Bichmond, Va.
Richmond, Va.
Richmond, Va.
H. B. TREVOR OG.
St. Louis, Mo.
H. W. SYKES
Morfolk, Va.
TURNER SUPPLY CO.
Chicago, Ill.
MoNIELLY MACHINERY CO.
Chicago, Ill.
MONIELLY MACHINERY CO.
Chicago, Ill.
MONIELLY MACHINERY CO.
Columbus, Ohio
Cie K. OLSEN
National Mass.
Providence, B. L.—New Haven,
Conn.
Conn.—Springfield, Mass.
Providence, B. L.—New Haven,
Conn.
Conn.—Pringfield, Mass.
Providence, B. L.—New Haven,
Conn.
ANCEY BROS.
Atlants, G.
Fercing Representative
THE DAY MACHINERY CO.
Chicago, Ill.
Monitorial Machinery Co.
Columbia, S. C.
Columbus, Ohio
Cie K. OLISEN
New Orleans, La.
PENTRACTOR & EQUIPMENT
CO.
Columbia, S. C.
Columbia, Principle Mass.
Providence, B. L.—New Haven,
Conn.
Anticolor, V.

JOS. S. POTTS, JR. & 00. Richmond, Va.

TURNER SUPPLY CO. Mobile, Ala.

WILSON-WEESNER-WILKINSON CO. Nashville, Tenn.

YANCEY TRACTOR CO. Albany, Ga.

Pareign Representatives: THE BRITISH STEBL PHANG CO., LTD. London, England



CKIERNAN-TERRY

The Pioneer Double-Acting Hammers



Thon

"SIX" AIR COMPRESSOR

Gives You Super Performance Plus Low Upkeep Costs



Because of the Super-Charger and Modern Design

The Thor Six Air Compressor is the only Compressor with a super-charger. This Super-Charger, which is a patented feature, enables the Thor to deliver 26% more air than any other compressor of the same rating, because it utilizes the idle or downward stroke of the piston to compress this additional air.

There is nothing complicated about the Super-Charger. It is simple and fool-proof. And it gives you more air for your money, which is what you want when buying a Compressor.

The Thor is the lightest, most compact and most powerful compressor of its size on the market. As it has no clutch, no coupling, no gears, it is the simplest unit made, with a record for low upkeep cost. Cast steel is used in the frame of the Thor in place of structural steel as it eliminates useless weight and minimizes vibration. The Thor is made in two sizes: 116 ft. rated capacity, which actually delivers 96 ft. of air per minute, and 250 ft. rated capacity, which actually delivers 210 ft. of air per minute. Compare this performance with any other Compressor performance and you will quickly realize why the Thor is the best Compressor buy on the market.

INDEPENDENT PNEUMATIC TOOL CO.

PNEUMATIC 246 So. Jefferson St. ELECTRIC

Warco Products do the job —easily ... quickly ... efficiently



NEW 1929 WARCO SCREWLIFT GRADER

FEW of us work for the love of the work alone . . . most of us cannot

afford to put in our time just for the fun we get out of it . . . the job must put money into our pockets if we are to continue in business.



The Warco Screw Lift "Built like a

Spinning the freely turning wheels in the cab, operates the screw lift through the circle controls and easily raises and lowers the grader blade.

Screw Jack"

Dependable under all conditions, WARCO road machinery enables you to make money on any road building or earth moving job . . . and get fun out of doing it!

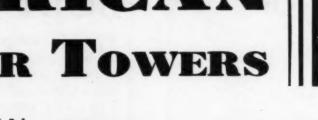
Interesting new bulletins are yours for the asking—let us send them to you with the name of our distributor in your vicinity.

WARCO PRODUCTS

W:A:RIDDELL COMPANY BUCYRUS:OHIO:U:S:A:

ONSTRU

AMERICAN **FUBULAR TOWERS**

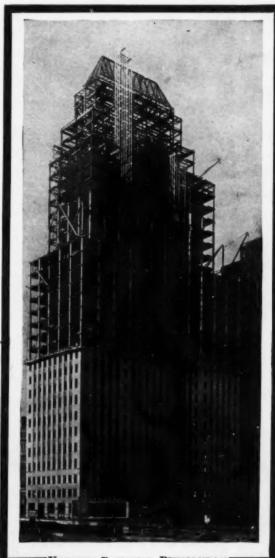


Pioneers in Steel Tubular Material **Handling Equipment**

American Tubular Towers were the first steel tube type of material elevators. They were built to supersede the wooden material elevating tower in response to contractors' demands for more efficient, material handling cost-saving equipment.

Carefully and thoroughly this pioneering work has been done over five years-each new year showing greater accomplishments towers of greater heights, greater adaptability, more efficient service, providing more extensive variety of uses a labor-saving boon to contractors.

Today, American Tubular Towers are leaders in this field of equipment. With their accessories, these towers can be leased or purchased from our nearest office or warehouse, conveniently located in every part of this country. Write for a catalog giving advantages and complete information.



KOPPERS BUILDING, PITTSBURGH Mellon Stuart Co., Contractors



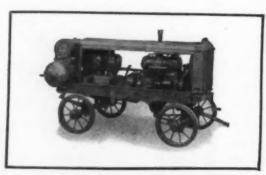
DRAVO EQUIPMENT COMPANY

GENERAL OFFICES: PITTSBURGH PA

DISTRIBUTORS IN PRINCIPAL CITIES

FOY
ROCK DRILLING
ROCK DRILLING
ASPHALT BREAKING
CONCRETE BREAKING
CLAY DIGGING
CLAY DIGGING
CALKING
REAMING
WOOD BORING
PILE DRIVING
RIVETING
TAMPING
SAND BLASTING

SCHRAMM



SCHRAMM, INC.
WEST CHESTER, PA.
Offices and Representatives in Principal Cities

CCTAMM

BOLT SLEEVES

FULL salvage of bolts used in form work is possible when Cleveland Bolt Sie eves are used. Forms are more easily removed and more lumber may be salvaged. It takes only one man to do to



only one man to do the job!

TEST CONTAINERS



Cleveland Test Containers, paraffin dipped, are ideal for taking samples of concrete, cement, asphalt, etc. Sizes 6 in. x 12 in. and 8 in. x 16 in. Shipped in cartons of sixteen.

Cleveland Paper Tube Products include dowel sleeves, form and bolt sleeves, test containers, blue print tubes, capped and uncapped tubes for casting railing, conduit and culvert holes, etc. Sizes ½ in. to 10½ in. diam. Write today for samples.

n A b T ha

To of

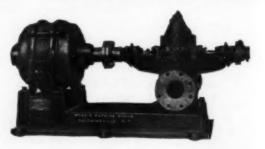
Chi

CO

The Cleveland Container Co. 10135 Berea Road, Cleveland, Ohio

Manufacturers of Paper Tube Products for the Construction Industry

MORRIS CENTRIFUGAL PUMPS



MORRIS PUMPS are made in all desirable types and sizes, motor, steam or gasoline engine, belt or chain drive, for domestic water supply, boiler feeding, circulating, irrigating, drainage, sewage disposal, hydraulic dredging, sand production and conveying, handling clean, dirty or acid water, etc.

Many popular types and sizes constantly in stock, and special designs built for unusual head, speed or capacity conditions. The advice of our Engineers on any pumping problems is free for the asking. Write at least for literature.

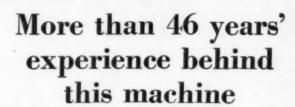
MORRIS MACHINE WORKS, Baldwinsville, N. Y.

Originators of Centrifugal Pumps, both Single and Multi-Stage, and builders for practically all purposes since 1864.

Branch offices:—New York, 26 Cortlandt Street; Philadelphia, Witherspoon Building; Cleveland, 1367 E. Sixth St.; Chicago, 217 N. Jefferson Street; Boston, 79 Milk Street; Pittsburgh, 329 Second Avenue; Detroit, 736 Fisher Bidg.; Charlotte, Resly Bidg.

Sales Representatives: —Buffalo, Kansas City, Omaha, Huntington, W. Va., Houston, and in other industrial centers.

Canada: Storey Pump & Equipment Co., Toronto.



REPUTATION means a lot to you in your business—a lot to us in our business and the wide poularity of the Gopher Shovel-Crane is more convincing evidence of the ability of American Hoist and Derrick Company in building high-quality, long life equipment. The American Hoist & Derrick Company have been building equipment for the contracting field over a period of more than 46 years.

To the thorough knowledge of the needs of the contracting field possessed by the *American* engineers is due the credit responsible for the remarkable construction of the *Gopher*.

When you compare the automobile type construction with the ordinary construction of other machines on the market; when you compare the operating speed—the work output, etc., you'll see how outstanding the American Gopher really is. Our new GOPHER catalog gives you all the details in pictures and in words. Write for it.

AMERICAN HOIST & DERRICK COMPANY

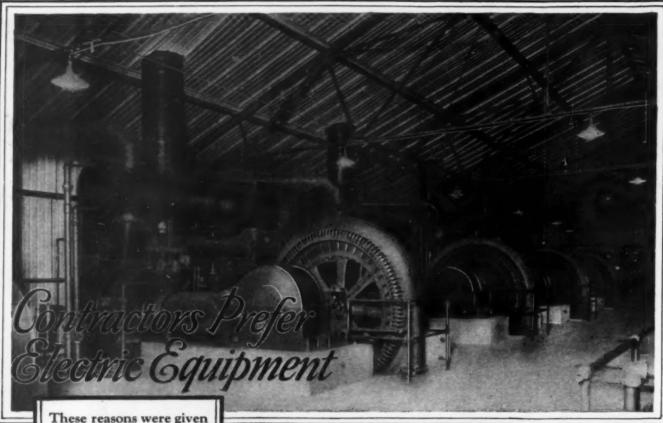
71 South Robert Street, St. Paul, Minn.

Chicago Seattle Pittsburgh New York Birmingham St. Louis New Orleans Detroit Indianapolis San Francisco Los Angeles



"AMERICAN GOPHER"
Shovel-Crane





These reasons were given by representative contractors, queried in a nationwide survey:

Economy
Few repairs
Low upkeep
High salvage value
Dependability
Best for cold-weather work
Breakdowns minimized
No smoke or soot
No handling of fuel or ashes
Reduced fire hazard
Convenience
Ease of handling and operating
Compactness
Flexibility

Noiseless

No water lines.

In the operation of AIR COMPRESSORS

Eight Ingersoll-Rand compressors are being used by Mason & Hanger Co., Inc., New York City, in the construction of the New York-Brooklyn subway tunnel under the East River. They are operated by G-E Motorized Power.

Mason & Hanger Co. is one of the many nationally known contractors who not only employ electricity on their projects but utilize it most effectively through G-E Motorized Power.

—and other contractors say:

"We have approximately 50 electric motors on our construction work with a total horsepower of approximately 650. We find that on electrically operated machinery we have less repairs and a more flexible operation, and for these reasons, wherever possible, we electrify our work"—James O. Heyworth, Inc., Chicago, Ill.



JOIN US IN THE GENERAL ELECTRIC HOUR, BROADCAST EVERY SATURDAY AT 8 P.M., E.S.T. ON A NATION-WIDE N.B.C. CHAIN

GENERAL ELECTRIC

CONS



BONEDRIED

A complete MORETRENCH WELLPOINT SYSTEM took eleven feet of water out of this excavation—dried up the quicksand—made it behave—sit up—and act—like a gentleman. And quicksand can do just that provided you treat it intelligently.

The job is for another downtown New York skyscraper—the gigantic Holland Plaza Building, covering an entire block. The Foundation Company of New York are the contractors.

Moore Trench Machine Co. Rockaway, N. J.

Have You Secured Your Copy of



DOMESTIC ENGINE & PUMP CO.

N. Queen St. and P. R. R.

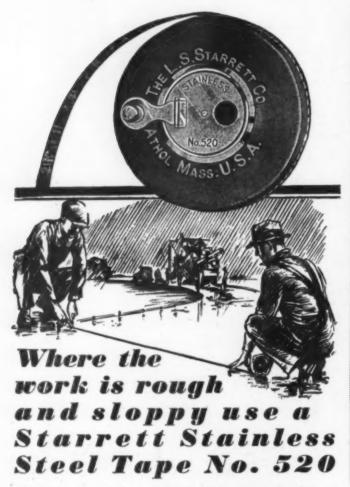
SHIPPENSBURG, PENNA.

"Excavating in Pre-Drained Wet Soils"?

This "Copyrighted" illustrated booklet contains much data of value to every Engineer or Contractor doing work in wet soils.

The edition is limited so you better fill out and mail coupon today.

to me "Excav	zati	ng		in	1	P	re	2-	D	r	a	ir	ne	d		V	V	el	t	S	ic	il	9	9	9				
Name										*						* 1									*				
Firm .			0 1		۰					9	0 (٠	0	•	0 0			0		0 1					0			
Address										*									*									* 1	
																													•



When the muck is on the markings and the cleaning rag is busy, only a tape with graduations that stand out and stand up will do. A tape clear and bright, that neither rusts or corrodes.

That is why the Starrett Stainless Steel Tape No. 520 is used on the tough jobs.

The quick reading Starrett method of placing foot figures before each inch mark saves time and prevents errors.

Write for the Starrett Catalog No.24"NF" which describes over 2500 Starrett Tools.

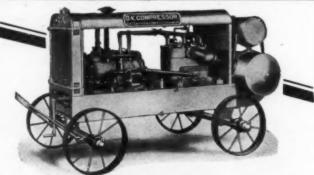
THE L. S. STARRETT CO.

World's Greatest Toolmakers
Manufacturers of Hacksaws Unescelled
Steel Tapes—Standard for Accuracy
ATHOL, MASS., U.S.A.



Use Starrett Tools





Made to meet the demand for high capacity at low price O.K. PORTABLE COMPRESSORS

O. K. Portable Compressors are built in three popular sizes, having piston displacements of 120, 160 and 265 cubic feet of free air per minute. The machines are made compact, readily portable, and were produced to meet the demand for reasonably priced High Capacity Compressors. Each outfit is enclosed with sheet steel roof and removable steel side doors, and furnished with heavy riveted air tanks, radiator with cast iron head and side members, and all necessary equipment.

INVESTIGATE O.K. PORTABLE HOISTS AND O.K. PORTABLE ELEVATORS

O. K. CLUTCH & MACHINE CO. P. O. BOX 305, COLUMBIA, PENNA.

CONSTRI

Champion All Service Water Hose

Champion All Service Water Hose is an important item in Republic's Champion Super Service Group.

Its quality is what its name implies—an "All-Service" Champion Water Hose.



CHAMPION ALL SERVICE WATER HOSE

WHEN the need for any rubber product next rises, remember that service-results have proven that Republic means the best mechanical rubber. Remember, too, that added quality and better prices are made possible because Republic uses the most direct and economical merchandising connection between manufacturer and consumer—the Industrial Supply Distributor. He functions as a marketing specialist for us; as a warehouse, buyer and economic adviser to you. Let us help you get in touch with our nearest distributor.

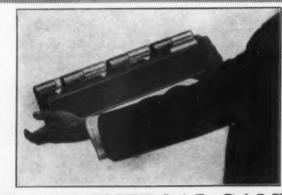
THE REPUBLIC RUBBER CO. Youngstown, Ohio

Belting - Packing - Hose Molded Goods - Lathe Cut Goods





METALWELD-WORTHINGTON PORTABLE AIR COMPRESSORS



The UNIVERSAL SAND TESTER FOIL P. CO.

TOT OIL

This little instrument will tell you whether your sand is good or poor before you use it, and give you the facts with a permanent record, quickly IS THE and cheaply.

It can be used in the laboratory, at the sand bank or on the job. Send for booklet "About Sand."

Sole Manufacturers
138 Fulton Street
New York KOLESCH & CO.

BULL ® FROG WHEELBARROWS

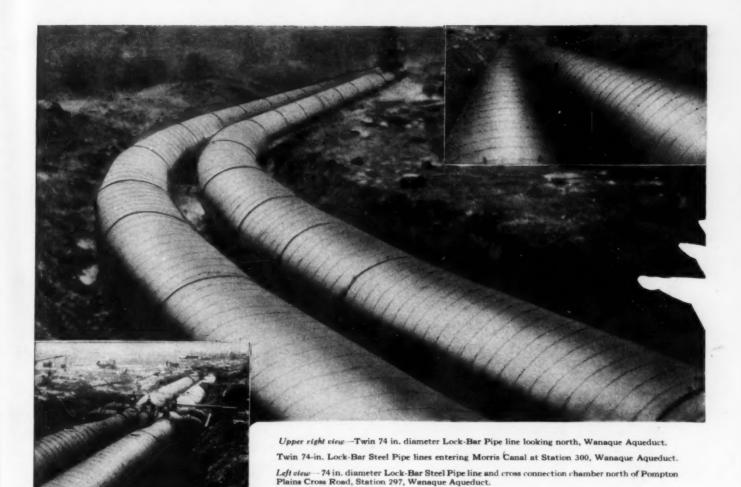
A Glutton for Work

The Bull Frog No. 42 Wheelbarrow, with its seamless, rolled-rim tray, sturdy reinforced frame, and easy-running "Never-Break" wheel, is an ideal general-purpose barrow for contractors because it combines strength with light weight and perfect balance. It has angle-iron legs, risers, wheel-guard loop and cross-pieces, and replaceable malleable iron shoes. Risers insure level tray while wheeling; guard-loop facilitates forward dumping: both add strength to the frame. Shaped handles provide firm and easy grip. This and many other efficiently-engineered Bull Frog Models are described in our new catalog, just off the press. Write for it.

THE TOLEDO WHEELBARROW CO. TOLEDO, OHIO

Branch Office and Warehouse Chicago-69 E. Wacker Drive





Largest Steel Pipe Contract ever awarded in the East

The Wanaque Aqueduct contract let to the T. A. Gillespie Company by the North Jersey District Water Supply Commission calls for an expenditure of over \$5,000,000.

This was for 164,000 ft. of 74-inch Lock-Bar Steel Pipe (about 35,000 tons of steel).

The installation of the pipe is now under way, as shown by these recent photos.

There are definite reasons of economy and service why Lock-Bar Pipe has been selected for the water supply systems of scores of prominent cities and towns of the United States and Canada.

EAST JERSEY PIPE COMPANY

7 Dey St., New York, N. Y.



Protect yourself! with simple and direct LIGHT

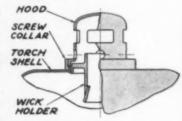
from a dependable source



TOLEDO TORCH

PRETTY colored lanterns may get you by with cautious drivers, if you hire a watchman to keep them on the job. But it's the reckless ones who cause all the accidents. With them the use of uncertain signals, such as red lanterns, is a needless risk for you to take, especially when it is so much more costly than using TOLEDO TORCHES.

The New TOLEDO TORCH is dependable in all kinds of weather, is very economical in the use of fuel, and is never molested by petty thieves. The secret



of its great success lies in the new ECONOMY BURNER. (Paternets Pending)

IT is the only burner that will give you satisfactory service at all times. Observe carefully its construction, and insist on having the genuine. Similar looking imitations do not compare in performance.

Ask for the 'Champion'

"the harder it blows the better it burns"

Made only by

THE TOLEDO PRESSED STEEL CO. TOLEDO, O.

ACCEPT NO SUBSTITUTE

Sterling

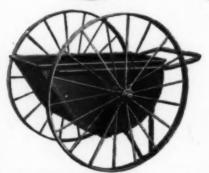
—is especially built for the "tough going" of contracting work. You'll find a Sterling will last longer and cost less.



No. 31—large concrete of wet material. Capacity, 4 cu.ft. struck. The casical wheeling big load barrow made. Will outlast others in toughest work.







No. 6—the atrongest builcapacity body, no axle in-ide Capacity 6 cu.ft. or 120 lbs. Perfect balance an casslest wheeling. 42-inwheels.

The above is but a few of the many, many Sterling types — write for complete catalog. Buy by STERLING name — leading hardware and equipment dealers have them or they can get them

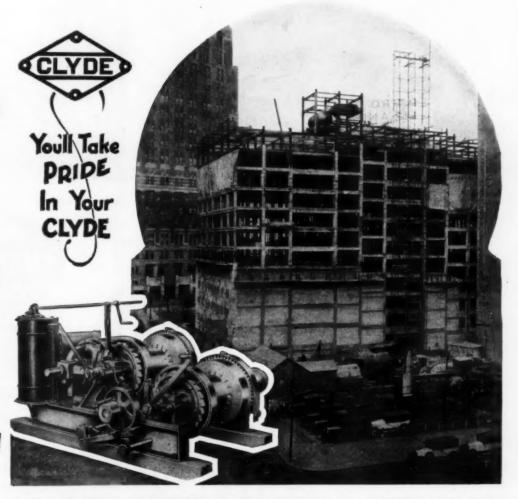
they can get them quickly from our complete stock warehouses at Chicago, New York, Philadelphia, Pittsburgh, Cleveland, Detroit, St. Louis.

STERLING WHEEL BARROW COMPANY
Milwaukee

HOSTS DERRICKS

For quiet and efficient operation, Clyde electric hoists give absolute satisfaction. One of the many features of these machines is the silent belt chain drive, which eliminates the clash and grinding of gears and reduces the wear and breakage to a minimum. Additional features and detailed information sent upon request.

PUT A CLYDE ON YOUR NEXT JOB



CLYDE IRON WORKS SALES CO.

DISTRIBUTORS FOR CLYDE IRON WORKS DULUTH. MINNESOTA

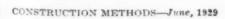
-BRANCHES-

NEW ORLEANS: 309 MAGAZINE ST.
PORTLAND, OREGON: 555 THURMAN ST.
SEATTLE: 3410 FIRST AVENUE SOUTH
CHICAGO: 11 SO. LASALLE STREET



MEMPHIS: 69 UNION AVENUE
NEW YORK: 856 EAST 136TH STREET
VANCOUVER, - - BRITISH COLUMBIA
1325 STANDARD BANK BLDG.

r of 🝇 Guaranted Quality



og.

or

em

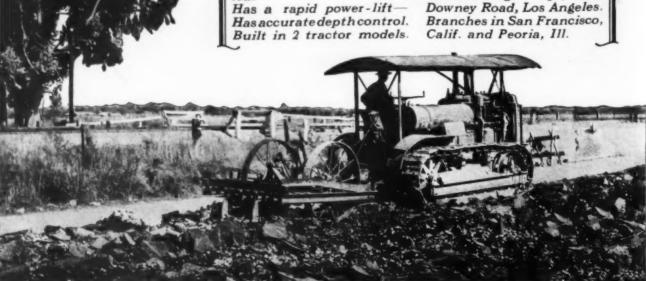
You'll find many jobs well suited to

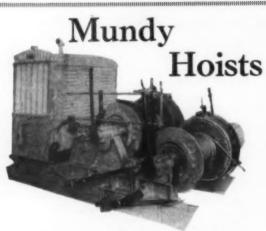
The Killefer Road Ripper!

The No. 10 Killefer Road Ripper working 12" deep in 3" of asphalt macadam on 9" of coarse gravel ballast. It will break out material for scrapers, graders, bulldozers, loaders or may be used for road plowing, roughing out or bonding.

Works as deep as 12"— Quick-detachable points are practical and economical—

Agencies throughout the United States and Canada. Write for folder R-94. Killefer Mfg. Corp., 5525 Downey Road, Los Angeles. Branches in San Francisco, Calif. and Peoria, Ill.





Standard of the World

Gasoline—Electric—Steam
Built up to a standard
Not down to a price.

Car Pullers—Cableways

J. S. Mundy Hoisting Engine Co. 722 Frelinghuysen Ave., Newark, N. J.

TRADE MARK
UNDY

ESTABLISHED 1869

Export Office, 30 Church Street, New York City Cable Address: BROSITES



The oper

ing 1

it is work

sprin later with equip ber o cause is gre

CONSTR

These new WILLIAMS Super-Buckets have improvements which place them far ahead of any other buckets you've seen—

The "Champions" welcome competition—and invite comparative tests. They are unrivalled diggers.

Write for folder "C" giving full description—and let us arrange for you to try a Williams "Champion" on your work

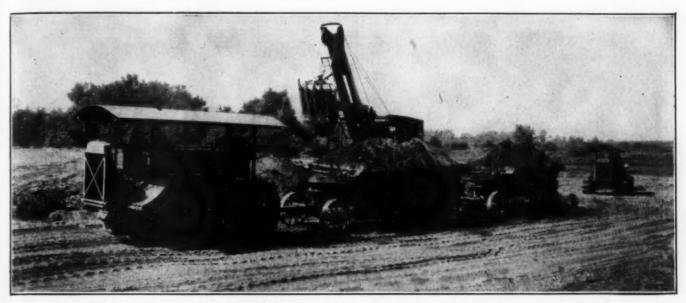
G. H. WILLIAMS COMPANY

607 Haybarger Lane, Erie, Pa.

Branch Offices: New York, Pittsburgh, Chicago

WILLIAMS

EAST-DIGGING BUCKETS



Building the Pekin-Bloomington road. One of S. J. Groves & Sons trains of Western 7-yard Crawler dump wagons at the shovel. Each heavily loaded train is hauling sixteen cubic yards over sand and rough ground, frequently working when round wheeled equipment could not operate.

More Hours of Production More Production Per Hour

The ability of Western Crawler wagons to operate under adverse haulage conditions increases the number of production hours during the working season. With these wagons

it is possible to begin work earlier in the spring and to work later in the fall than with round wheeled equipment. The number of days lost because of wet weather is greatly reduced and the tireless motorized equipment makes a 24-hour day possible.

The enormous load Western Crawler wagons carry, increases the production per hour un-

der good haulage conditions as well as bad. They will give you more hours of production and more production per hour. Bulletin 29-AL explains in detail. Write for a copy.

Important Notice

The Manufacture of these wagons is broadly covered under the Benbow-Green Patent No. 1,706,099, issued to Western Wheeled Scraper Company.

Other Patents Pending.

Western Wheeled Scraper Company Aurora, Illinois, U. S. A.

WESTERN STRING

DUMP CARS AND GRADING EQUIPMENT



On Big Jobs

Here's the Cleveland C6 Paving Breaker on a big railroad job. Why?

Because it's ideal for this kind of demolition work. Due to increased traffic this road finds it necessary to tear down and rebuild several concrete bridges. The structures are massive, well seasoned, heavily reinforced jobs, and it takes Cleveland C6's for tough work like this.

Write for demonstration.

-and Here's A New One!

The Cleveland Type S D Sheathing Driver with the Flexible Shank.

Set in rubber the shank is flexible, withstands "side slap." The shock being absorbed, shanks stand plenty of abuse and don't break easily.

Order some for trial.

The Cleveland Rock Drill Co. 3734 E. 78th St., Cleveland, Ohio

Branches, Agents, Service Stations, in Principal Cities

See Pages 150-151, Keystone Metal Quarry Catalog.





A Sensational Performer and Money Saver

THE speed, versatility, rugged construction, big yardage and low cost of the Fundom combination shovel, ditcher and crane, make it a sensational performer and money saver.

It makes small jobs profitable. Fast, full 3/4 circle swing, 1/3 yard dipper capacity, 16½ foot radius, gasoline power.

With Trench Hoe attachment for ditching or Boom Extension for clamshell, dragline or crane, the Fundom is an unbeatable three-in-one digging machine.

Get the details and name of nearest dealer. Address-

The Fundom Hoist & Shovel Co. 314 Central Building, Lima, Ohio



A Smooth Worker—that Sticks to its Job!

The best friend any power shovel ever had is Dixon's Waterproof Graphite Grease. Its smooth unctuous veneer spreading over the contacting surfaces of gears and bearings—penetrating between every strand of wire rope—produces smooth, slippery bearing surfaces that defy friction, wear and corrosion.

Pressure can't squeeze it out—water can't wash it off—neither heat nor cold impair its efficiency.

The sooner you get this smooth worker on your job, the more money you'll make an \ save.

Circular 86-W tells the schole story.

DIXON'S
WATERPROOF
GRAPHITE
GREASE

A

ag

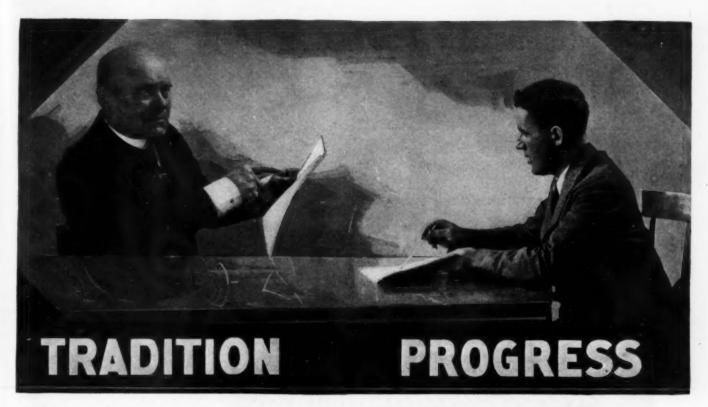
jus

CONS

JOSEPH DIXON CRUCIBLE CO.

JERSEY CITY NEW JERSEY

Established 1827



"Here, Lad-

I have your memo about some of my manufacturing friends dividing their purchases of motors between 'Linc-Weld' and whatever type formerly used.

Are you trying to sell me on bigamy? I'm against having more than one make motor just as I'm against having more than one wife."

"Linc-Weld" Superiority is due to:

- 1. Larger Shafts
- 2. Larger Bearings
- 3. Better Insulation
- 4. Stronger Frame (Steel)
- 5. Greater Overload Capacity

"Yes, Pop-

I'm not selling bigamy, but trial preparatory to change. While you can and must put up with some shortcomings from a wife, there's no law to make you stand for it from a servant.

And when a better servant is available at the same cost, who doesn't tire, break or require sick leave—then it's inertia only that keeps a man from change.

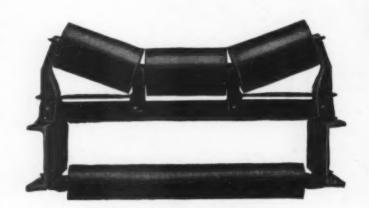
Now, 'Linc-Weld's' famed overload capacity means that it will work early and late for us on a grind that wilts our present motors.

'Linc-Weld's' complete welded steel construction prevents any breakage — and its double size shafts and bearings, with superinsulation, preclude the time-off-for-repairs that is troubling us.

So, Pop, if I'm selling you bigamy, it's in the same sense that bigamy means one wife too many . . . and for that matter monogamy, in certain instances, is the same thing."

The Lincoln Electric Co., Dept. No. 32-6, Cleveland, Ohio

LINCOLN MOTOR



sendfor

BULLETIN NO. 105-CM

THE PAURIFUELD WAY

We manufacture elevating and conveying machinery, including the Stearns-Fairfield Lifetime Idler for heavy duty belt conveyor service. Widths from 16" to 72" diameters 5, 6 or 7". Timken Roller Bearing equipped. Designs and estimates on complete installations furnished. Send for Bulletin 105-EM and prices.

THE FAIRFIELD ENGINEERING CO

THE COURSE OF REAL PROPERTY.

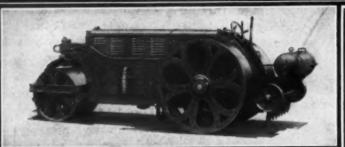
4 CYLINDER MOTOR ROLLERS

POWERFUL AND DEPENDABLE

QUICK IN ACTION

ECONOMICAL TO OPERATE

315 E. CENTER ST.



THE HUBER MANUFACTURING CO.

MADE IN FOUR SIZES

5-7-10-12 TONS

SEND FOR HUBER ROLLER CATALOG

0

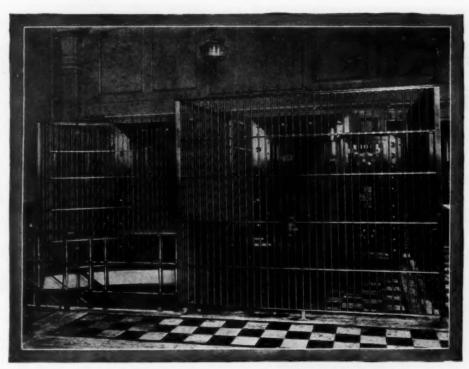
LO

LO

CO

MARION, OHIO





Vault in the new building of the Atlanta and Lowry National Bank; Atlanta, Ga., where "INCOR" Brand Perfected High-Early-Strength Portland cement was used to cut two weeks off the normal construction schedule.

TWO WEEKS Saved with "INCOR" Enables New Bank to Open on Time

IN building the vault of the new Atlanta and Lowry National Bank branch, Atlanta, Ga., the contractors were faced with a difficult time-problem. Only five weeks remained in which to complete the

bank in time for the announced opening date. Four weeks were required to install the steel work, fittings, doors, etc. That left one week for concrete work.

"INCOR" Cement solved the problem. By using "INCOR" the concrete work was finished and ready for the steel seven days after the work was started. Thus, the steel

workers had ample time to finish their part of the work; the two weeks saved with "INCOR" made it possible to open the bank on scheduled time.

"INCOR" Brand Perfected High-Early-Strength

Portland Cement contains no admixtures; requires no special methods of handling. It produces permanent dependable Portland cement concrete that is ready to use in 24 hours. Whenever the time-element complicates an engineering problem and difficult schedules must be maintained, it pays to specify "INCOR."



Outstanding quality and a policy of fair business dealing have earned nation-wide recognition for LONE STAR Cement, Now, to meet the need for dependable 24-hour concrete, the makers of LONE STAR also offer "INCOR" Brand

INTERNATIONAL CEMENT CORPORATION

342 Madison Avenue, New York

One of the world's largest cement producers—13 mills . . . total annual capacity 20,000,000 bbls.

LONE STAR CEMENT COMPANY ALABAMA Birmingham, Alabama LONE STAR CEMENT CO. INDIANA, Inc. Indianapolis, Indiana THE CUBAN PORTLAND CEMENT CORP. Havana, Cuba

SUBSIDIARIES

LONE STAR CEMENT CO. INDIANA, Inc.
Indianapolis, Indiana
THE CUBAN PORTLAND CEMENT CORP.
Havana, Cubas
LONE STAR CEMENT CO. PENNSYLVANIA
Philadelphia, Pennsylvania

THE LONE STAR CEMENT CO. VIRGINIA, Inc.
Norfolk, Virginia
LONE STAR CEMENT CO. NEW YORK, Inc.
Albany, New York

New Orleans, Louisiana
ARGENTINE PORTLAND CEMENT CO.
Buenos Aires, Argentina
LONE STAR CEMENT COMPANY TEXAS
Dallas and Houston, Texas
URUGUAY PORTLAND CEMENT COMPANY
Moutevideo, Uruguay

LONE STAR CEMENT CO. LOUISIANA New Orleans, Louisiana

Metaforms for every form building requirement

You can easily see how these forms save their cost



when you realize that

the money invested in lumber for forms in one year, if invested in Metaforms, would furnish you with equipment that would permanently eliminate these lumber bills.

Furthermore, when you see unskilled laborers take an outfit of simple steel plates and actually accomplish in *hours* what it would take skilled carpenters *days* to do with old methods, you can even see a profit the first time you use them.

GET these two profit-making Books



They tell you just what you can do with Metaforms on straight wall and circular construction.

METAL FORMS CORPORATION Milwaukee, Wis.



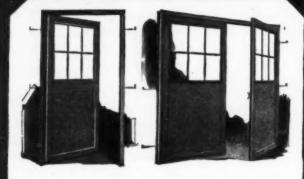
It is to the men already using Buffalo-Springfield Rollers that we direct you for a frank, unbiased opinion of their practical worth. They, of all men, can best explain why the Buffalo-Springfield is, and long has been, the leader among road rollers.

Various models, steam and motor driven. All practical sizes. Scarifier and other attachments when desired. Booklet upon request.

The Buffalo-Springfield Roller Co.
Springfield, Ohio

BUFFALO · SPRINGFIELD





Slide, Swing, Lift, Folding, Lift-Swing and Hangar Doors. Standard and Special Types. Rigid, durable and fireproof.

Write for catalog and prices.

TRUSCON STEEL COMPANY YOUNGSTOWN, OHIO

STEEL DOOR DIVISION

Warehouses and Offices in all Principal Cities





Engineers and Contractors Will Profit by Specifying "3-C" Calcium Chloride for Curing Concrete

106 Orchard St.

The use of "3-C" Calcium Chloride in curing concrete is a proved economy.

stead of I Beams. This gives beams of

It saves time and money!

Curing with "3-C" Calcium Chloride secures much earlier strength. Forms and molds are released in less time, speeding up production. Roads—floors—sidewalks are opened quickly.

Concrete products are ready for use without waiting for a long curing period to elapse.

"3-C," 77%-80% Calcium Chloride is offered in convenient flake form. It is noted for its purity

It is noted for its purity and uniform quality.

Sold in handy 100-lb. water-proof bags and in steel drums containing 400 lbs.



Albion, Penna.

Profit by the advantages of "3-C" Calcium Chloride curing on your jobs. Send the coupon today for complete details.

Our laboratories and technical staff are always at your service for information and aid.

THE COLUMBIA PRODUCTS CO. BARBERTON · · · · OHIO

"3-C" Calcium Chloride is manufactured by the Columbia Chemical Division, Pittsburgh Plate Glass Company under Patents No. 1,592,971 and 1,527,121.



BAKER MANEY Self Loading Scrapers

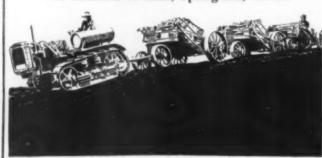
The original self-loading scrapers continue to show their ability to move large quantities of dirt with two to three men. They dig, load, haul, dump and compact the dirt as a single outfit.

They are available in three sizes— $\frac{3}{4}$, 1 and $\frac{1}{2}$ cubic yard capacities to suit your job or your tractor.

Write for these Baker Bulletins

Bulletin No. 263—Baker Maney Scrapers
Bulletin No. 256—Baker Rotary Scrapers
Bulletin No. 270—Baker Road Maintainers

The Baker Manufacturing Co. 568 Stanford Avenue, Springfield, Illinois



Buhb

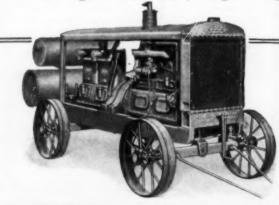
Make Bigger Profits

Because they embody up-to-the-minute features that enable them to produce compressed air at the lowest possible cost.

The Buhl Line of air compressors offers the widest possible selection of portable compressors in sizes 36, 55, 90, 100, 110, 220 and 330 cu. ft. displacements per minute.

Write for Descriptive Literature.

The BUHL Company
General Offices: Old Colony Bldg., Chicago



CON



FOR their particular haulage requirements, this new Porter unit has proved ideal for the Northern Illinois Coal Corporation. It possesses great tractive power, and speed, pulls maximum coal tonnage at low cost, and can be controlled with remarkable ease.

With the development of this new unit, Porter is now in an unexcelled position to advantageously meet any industrial haulage requirement whether it calls for a steam locomotive, gasoline locomotive or the gasolineelectric locomotive illustrated above. Descriptive details will be sent on request.

H. K. PORTER COMPANY

Established 1865

PITTSBURGH, PENNSYLVANIA

Chicago Office: Engineering Building, Wells Street and Wacker Drive New York Office: 44 Whitehall Street





POSITIONS WANTED

CONSTRUCTION engineer, 3 years highway work, 4 years steel mill construction, wants work with contractor or highway department, PW-80, Construction Methods, 520 No. Michigan Ave., Chicago, III.

EXPERIENCED highway construction engineer desires position with reliable contractor. Salary \$250 per month. Available at once. Box 67, Tionesta, Pa.

FOREMAN, 16 years' experience on highway and general construction topen cut1. Can furnish best of reference. Will consider any location, PW-90, Construction Methods, Tenth Ave. at 36th Street, New York.

3 PLANTS AND CONOWINGO

We can furnish equipment on rent, or sell for the smallest and largest construction projects.

> Our list includes: AIR COMPRESSORS BAR AND PIPE BENDERS BOILERS BUCKETS

BUCKETS
CARS
CARS
CONCRETE MIXERS
CONCRETE PLACING EQUIPMENT
DERRICKS
DRILLS
ENGINES
HOISTS, Electric, Gasoline or Steam
Locomotives
MOTORS, Electric
PUMPS
SAWS
STEAM HAMMERS
STEAM SHOVELS
TRACTORS

Write for latest Stock List just off the press.

Equipment Corporation of America

656 Horn Bldg., 1601 Chestnut St., Philadelphia, Pa. 856 Empire Bldg., Pittsburgh, Pa. 1156 8. Washtenaw Ave., Chicago, Illinois. Box 86 Conowingo, Maryland

Must Remove by June 15th

+-Terry Turbines, 95 h.p. 3,650 r.p.m.

2-65 - Ton American Locomotives, Standard Gauge.

1-60-Ton Shay Locomotive, Standard Gauge.

-De Laval 5" Centrifugal Pump, 800 gal. lons per minute.

25-Motors, rating from 1 to 300 h.p.

All in first class condition.

Can be inspected at New Village, N. J.

Will sacrifice for quick sale.

Write, wire or phone immediately
for details and prices.

Edison Portland Cement Co. Stewartsville, N. J.

Bought. Sold. Rented.

Service, Stocks on hand everywhere.

149 Broadway

NewYork

TEEL SHEET PILI



Saves you money and trouble in Foundation, Cofferdam, and Sewer work.

Bought-Sold-Rented-Always carried in stock LONG DISTANCE TELEPHONE: CENTRAL 0491

S.W. LINDHEIMER, Inc.

31 South Clarke St.

CHICAGO

Cle Cly

Co

Cor Die

Dix

Dog Dor

Dra

ODEE Pipe for gas lines—factory-welded into double lengths, to cut field welding. Plain end and threaded pipe, with or without couplings. Casing in all sizes. All ready for immediate Shipment from strategic centers.

Jos. GREENSPON'S Sons IRON & STEEL CO.

ST. LOUIS TULSA

NEW YORK CITY BORGER, TEX.

WHEATLAND, PA.

FOR SALE

-19x26-in. Six Wheel 3witchers;

Walschaert Valve Gear, ICC. 50-ton, Saddle Tank, New Boiler, New Cylinders. Also four Saddle Tanks, 21 tons to 50 tons. Cylinders.

20-Dump Cars, Western, 12-yd. steel center sill.

Have Forty Locomotives Overhauled and ready, 5 to 100 tons. Curs, Shovels, Cranes, Rail, Etc.

Southern Iron & Equipment Co. (Established 1885 Atlanta, Ga.

you don't see the equipment you need advertised on these pages, send a list of your requirements to the Searchlight Department, Construction Methods, Tenth Avenue at 36th Street, New York City. You will be put in prompt touch with reliable sources of supply.

"Opportunity" Advertising:

Think "SEARCHLIGHT" First!

4.02

CONSTI

ALPHABETICAL INDEX TO ADVERTISEMENTS

Page	Page	Page
American Fork & Hoe Co 79	East Jersey Pipe Co	Mohawk Asphalt Heater Co 90
American Hoist & Derrick Co 97	Edelblute Company, T. H 29	Monarch Tractor Corp
American Institute of Steel Constr 14	Eisemann Magneto Corp110	Moore Trench Machine Co 99
Ames Shovel & Tool Co 18	Fairfield Engrg. Company110	Morris Machine Works 96
Atlas Portland Cement Co 73	Fate-Root-Heath Co	Morse-Starrett Products Co100
Austin Western Road Machry. Co.	Foote Bros. Gear & Mch. Co 87	Mundy Hoisting Engine Co., J. S. 106
Insert pages 81-82	Foote Company 20	National Carbon Co 6
Baker Mfg. Co114	Fundom Hoist & Shovel Co108	Northern Conveyor & Mfg. Co 77
Barber Asphalt Co114	General Electric Co 98	Northwest Engineering Co 5
Barber-Greene Co 86	Golden-Anderson Valve Spec. Co 117	Novo Engine Co
Barnes Mfg. Co 92	Good Roads Mehry Co	O. K. Clutch & Mchry. Co 100
Bay City Shovels, Inc 90	Haiss Mfg. Co., Inc., George. 4th Cover	Owen Bucket Co
Bethlehem Steel Co	Hercules Motor Corp 91	Plymouth Locomotive Works 25
Browning Crane Co	Homelite Corporation 75	Porter Company, H. K115
Bucyrus-Erie Company	Huber Mfg. Co110	Ransome Concrete Mchry, Co 69
Buffalo-Springfield Roller Co112	Hunt & Son Co., C. B 88	Republic Rubber Co101
Buhl Company	Hughes-Keenan Co	Riddell Co., W. A 94
Butler Bin Company	Independent Pneumatic Tool Co 94	Rogers Brothers Corp113
Byers Machine Co 3	Ingersoll Rand Co2nd Cover	Schramm, Inc
Carey Company, Philip 10	Insley Mfg. Co	Searchlight Section
Carnegie Steel Co	International Cement Corp111	Starrett Co., L. S
Carter Co., Ralph B117	Jaeger Machine Co	Sterling Wheelbarrow Co104
Caterpillar Tractor Co 71	Keystone Driller Co	Sullivan Machinery Co
Chevrolet Motor Co 8	Killefer Mfg Corp106	Thew Shovel Co 67
Cleveland Container Co 96	Koehring Company	Toledo Pressed Steel Co
Cleveland Rock Drill Co108	Kolesch & Company102	Toledo Wheelbarrow Co
Cleveland Tractor Co	Lakewood Engineering Co	Union Iron Works
Columbia Products Co	LeRoi Company	Universal Crane Co
Columbus-McKinnon Chain Co 74	Lincoln Electric Co	Universal Portland Cement Co 30
Continental Motors Corp3rd Cover	Lowell Wrench Co	Universal Power Shovel Co 80
Dietz Co., R. E	McKiernan-Terry Drill Co 93	Watson-Stillman Co 90
Dixon Crucible Co., Joseph108	Marion Steam Shovel Co 19	Waukesha Motor Company 28
Dodge Bros. Corp 78	Metal Forms Corp112	Western Wheeled Scraper Co107
Domestic Engine & Pump Co 99	Metalweld, Inc	Willamette-Ersted Co 70
Dravo Equipment Co 95	Metropolitan Paving Brick Co42-43	Williams Co., G. H106

GOLDEN-ANDERSON VALVE SPECIALTY CO.



AUTOMATIC CUSHIONED STEAM AND WATER-SERVICE VALVES "We Challenge to Test for Merits Any Automatic Steam or Water-Service Valves in the World" 1330 Fulton Bldg.

PITTSBURGH, PA.



HUMDINGER PUMPS

Non-clogging, everlasting rubber ball valves, totally enclosed, running-in-oil jacks, bronze bushed bearings, all steel trucks, and enclosed engine crank cases make HUMDINGER PUMPS.

THE CONTRACTOR'S CHOICE

Full detail description given in Bulletin No. 1034 CM. Send for a copy.

RALPH B. CARTER CO., 53 Park Place, New York Factory: Hackensack, N. J.



While normally equipped with a movable weight type scale, the Butler Weighing Batcher may be furnished with a separate scale beam and movable poise for each material to be weighed. Where desired, a fulf-capacity, dial-type scale can be furnished.

Butler weighing batcher with All-Steel Scale

THE New Butler Weighing Batcher is simple in construction and easy to operate.

It has fewer working parts than other weighing batchers and is most easily handled in shipping for it ships completely assembled and may be attached to any bin — wood, concrete or steel.

The scale is All-Steel and is arranged to weigh one, two or more aggregates with the same mechanism. A trigger weight control puts weights for each material in position as needed. A simple tell-tale dial shows overweight or underweight. The scale is equipped with an oil dash-pot to regulate sensitiveness. Direct operated radial gates and counterweighted, automatic opening and closing discharge gates, provide instant and positive control.

Study the advantages of this new Batcher before you purchase equipment for this season's operations.

BUTLER BIN COMPANY, Waukesha, Wis.

Representatives in



Fifty Principal Cities

BUTLER
Steel BINS







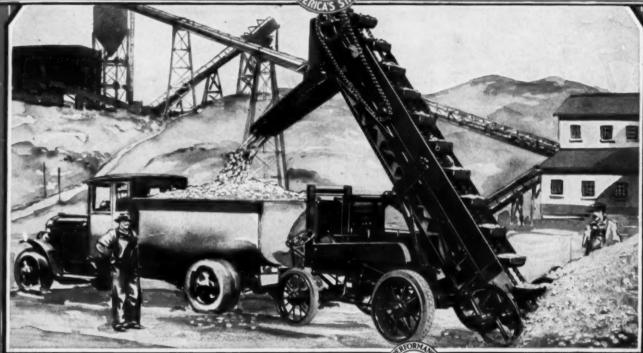




BUTLER BIN COMPANY . WAUKESHA, WIS

Dependable Power for Every Purpose

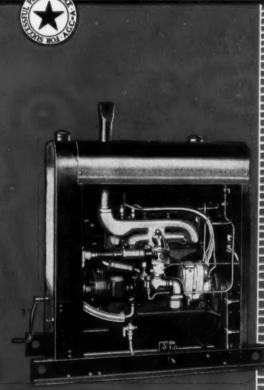




The Spearwell Mogul Junior Loader powered with a P 20 Heavy Duty Continental Engine loads trucks and other conveyances with a dependable speed that spells economy at every turn. Whether it is in building construction or road developing Heavy Duty Continental Engines furnish the power to do the job-continuously in all sorts of weather. Such performance is the right of 28 years' well-directed efforts in developing and producing gasoline power plants.

CONTINENTAL MOTORS CORPORATION

DUSTRIAL EQUIPMENT DIVISION ice and Factory: Muskeron, Michigan



Continental Engines



HAISS Reissue Patent Number 15,515 has been declared valid and infringed. It covers broadly the use of inclined feeding propellers or paddles on a loading machine.

Haiss is the originator of this simplest and most efficient device for making a loader self feeding, and which combines positive feeding with digging ability.

The U.S. Circuit Court of Appeals for the 3rd Circuit has sustained this Haiss patent, and that decision has become final.

GEO. HAISS MFG. CO., Inc.

139th Street and Canal Place

New York, N. Y.



Notice To The Trade

For the protection of our Customers and Distributors we shall vigorously continue to protect our rights.

Manufacturers, Sellers and Users of Infringing Machines are alike liable to suit and injunction.

For your Loader requirements purchase a machine you can use without interruption and royalties.